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A volume of lectures delivered at a formal workshop on institutional research, held at Stanford University in July 1959 under the cosponsorship of WICHE and Stanford University. Covers major areas of institutional research, including the background and organization of such research and discussions of research studies on students, faculty, budgets, program, and space and campus planning. Also contains a chapter by T. R. McConnell on the program of the Center for the Study of Higher Education and a chapter offering some observations on American higher education by Donald G. MacRae, Visiting Professor of Sociology at the University of California, from the London School of Economics.

Publication contains extensive bibliography and a 74-page appendix consisting of forms, instructions, and illustrative tabulations for the analysis of class size, teaching load, and instructional costs. Various chapters of *College Self Study* are listed separately under appropriate categories in this issue of the Reporter. *See* 7374, 7394, 7395, 7396, 7397, 7406, 7407, 7408, 7413, 7440, 7441, 7483, 7484, 7485, 7487.

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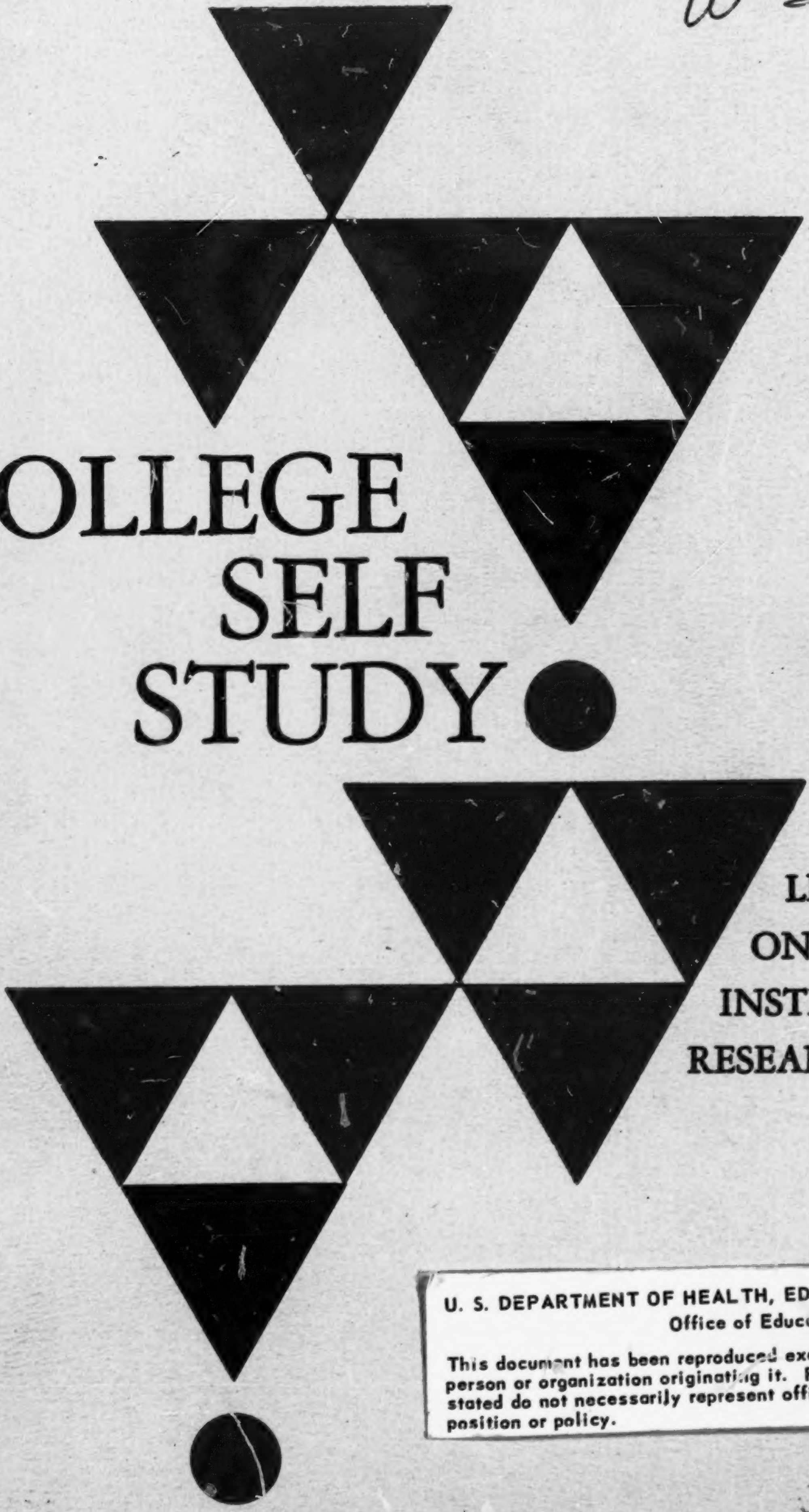

COLLEGE SELF STUDY

LECTURES ON INSTITUTIONAL RESEARCH

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

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Western Interstate Commission
For Higher Education

ED000144

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COLLEGE SELF STUDY

Lectures on Institutional Research

Given at Stanford University, July 19-25, 1959

RICHARD G. AXT and HALL T. SPRAGUE, Editors

The Western Interstate Commission for Higher Education
Fleming Law Building
Boulder, Colorado

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Foreword

The Commission is pleased to publish this volume of lectures on institutional self study by colleges and universities.

In July 1959 the Commission, with the co-sponsorship of Stanford University, held the first formal workshop on institutional research by colleges and universities in the Western region. It was attended by more than 130 college and university officials from all 13 of the Western states and from 12 states outside the West. From all reports, this workshop has been a major force in stimulating more institutional self study and better-organized self study at many of our Western colleges and universities.

The Commission sponsored the workshop because, in this era of mounting student enrollments and mounting costs, it is imperative that every college and university fully understand its own operations and make maximum use of its teaching, financial, and physical resources.

We were very fortunate to have as the staff of the institute, many of the outstanding scholars and practitioners in the field of institutional research. In the belief that the lectures given at the Stanford institute are the most complete over-view of this field presently available, the Commission is pleased to make this volume available to a wider audience.

It is our hope that these papers on institutional research will be of genuine help, not only to Western colleges and universities but to colleges in other parts of the country as well.

HAROLD L. ENARSON, DIRECTOR

Western Interstate Commission
for Higher Education

NOTE ON SOURCES

All bibliographical references in the original lectures have been included in the appropriate section of the bibliography beginning on page 265.

In each lecture, sufficient identification of books and articles referred to has been given to permit the reader to locate the full citation in the bibliography.

Preface

This volume contains lectures, usually with a "how-to-do-it" emphasis, on the major areas of institutional research. The lectures should not be considered definitive because institutional research, on an organized basis, is new and in a state of rapid development.

These lectures should, however, be helpful to most college and university administrators because very few institutions presently have an institutional research program of the scope covered by this volume.

The participants at the Stanford Institute for College and University Administrators on Institutional Research received the equivalent of three loose-leaf notebooks of study materials. These materials consisted of lecture outlines (not the texts of the lectures), sample questionnaires and worksheets, reports of institutional research studies of various kinds, statistical tables, and reprints of key articles. Limitations of space and cost have made it not feasible to reproduce those study materials in this volume, useful though they might be.

Many of the lecturers could, however, supply sample copies of some of the forms and worksheets they use to those readers who are especially interested in a specific area of institutional research. Also, the books and articles cited in the bibliography have many suggestions on procedures to be used in institutional research.

In his chapter on "The Purpose and Organization of Institutional Research," Dr. Russell points out that very few colleges or universities have set up an office--even a one-man office--to coordinate their institutional research program. And it is still true that a conference of all those professionally engaged in this field on an institution-wide basis could meet (and have met) in a small conference room.

We have, nevertheless, published this volume because institutional research has the fastest growth rate of any administrative function in higher education. The Southern Regional Education Board is sponsoring a workshop on institutional research in July 1960 which will have an attendance of over one hundred persons.

WICHE, as a follow up to the Stanford Institute, is sponsoring, in July 1960, a specialized, four-day institute on Institutional Research on Students. More than 70 persons are expected to attend.

The number of persons in the thirteen Western states with the phrase "institutional research" in their title and who spend essentially full-time on this function has tripled in the year since the Stanford Institute. The labor market for qualified institutional research officers is as tight as in any area of higher education.

It seems clear that for many years to come, institutional research officials will be recruited largely from other areas of college administration and from the faculty. Institutes such as that at Stanford and the institute sponsored this year by SREB will "train" most new institutional researchers. (Given the American penchant for professionalization, however, it would be surprising if some enterprising institution does not soon offer a full-blown degree program in institutional research. Where a qualified faculty would be found, except during summer sessions, is another matter.)

It is to this new and growing group of college administrators with a major responsibility for institutional research that this volume is dedicated.

We wish to acknowledge the contribution of the lecturers who, in addition to giving these lectures, gave generously of their time in preparing study materials for the Stanford Institute and in suggesting items for the bibliography. The bibliography was organized and brought up-to-date by Mrs. Virginia Boucher. Final copy was typed by Mrs. Patricia Halaas. The volume was designed and prepared for the printer by Mrs. Lura Elliott.

It is our earnest hope that this volume, although perhaps a pioneering effort in its modest way, will be out-of-date in just a few years. Given the present growth of institutional research, both in quality and quantity, we expect this hope to be fully realized.

Richard G. Axt
Hall T. Sprague

Western Interstate Commission
for Higher Education

June 20, 1960

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Appendix A A-1

Background and Organization of Institutional Research

I. Two and a Half Centuries of Institutional Research

. . . . W. H. Cowley

Some of you are probably surprised at the title of this paper. In asking me to write it, Dr. Axt suggested that I review the last thirty years of American college and university institutional research; but he agreed to let me extend the period to a century and a quarter. After I got started organizing my notes and looking into the topic further, however, I regretted that I hadn't proposed twice that long because I found that I need to begin with the year 1701. I'll describe what happened in that year presently, but let me first explain my understanding of the term institutional research.

- 1 -

The adjective institutional requires no comment since obviously in the context of this conference it refers to a college or university. The noun research, however, needs attention. It has become one of the magic words of the twentieth century, and hence almost everyone seems to want to muscle in on its fabulous prestige. Even elementary school children use it to describe going on trips to museums and zoos, and the other day a salesman who came to our front door at home exploited it in his sales pitch. He said that he was researching our family need of a fuller line of kitchen and garden brushes. In response to my interested query about his use of the term, he observed that it gets his foot into more doors than any other gambit.

All prestige words take on multiple meanings as, for example, the word humanism, the concepts behind which one of my students is currently investigating. On the title page of his study, he tells me, he plans to reproduce an observation of the late Hans Zinsser which reads: "There are as many sects of humanism as there are Protestant churches." Or consider the term liberal education which, incidentally, is rapidly being outmoded by the recently coined locution "humanistic education." A few years ago I identified eight quite different meanings of "liberal education," and I'm sure that a more careful search will turn up at least as many more.

Perhaps you've noticed that I've just used the word "search." After wondering for some years about the difference between a search and a research, I once looked up the history of the two words to see if I could discover why we typically employ the latter word to designate hunting for an answer to an intellectual problem. I found that English writers in the late sixteenth century took over the French word *rechercher*, and quite unexpectedly I also found that the first users of both the French and English versions of the word were literary scholars and not scientists. The word emerged before the beginning of extensive scientific experimentation and during the heyday of emphasis upon the purity of the translations of the recently repossessed works of classical authors. Thus the originators of the term prefixed the word *search* with *re* to accent the fact that they had searched again the original documents anteceding the books they were studying.

When philosophers, scientists, and others began to employ the word, however, the idea of *searching again* faded out. Thus in both French and English the prefix *re* came to signify the *purposes* behind searching again rather than that activity per se. The purposes of the literary scholars who coined the word were clearly thoroughness and carefulness, and so for a long period now the word research--to cite the Webster definition--signifies a careful search, studious inquiry, exhaustive investigation. Educational research, therefore, consists in any thorough-going investigation of an educational problem; and institutional research in higher education constitutes such an investigation of any topic concerning which a college or university or a group of them collects or seeks to collect data toward the end of improving operations. I have used this definition in the writing of this paper.

I wish that I could now move on to my assignment of reviewing the history of institutional research in American higher education, but I must first point out that some influential people do not accept the definition I've just given. By research they mean a specific kind of inquiry, namely, a scientific investigation. They hold that if a study isn't scientific, then it can't be called research. They also hold that if a study isn't quantitative, then it can't possibly be called scientific. In short, they maintain that if an educational investigation doesn't employ statistical concepts such as "the standard deviation of the mean," "Chi-Square," and "probable error," then it's not research.

I hoped when I began writing this paper that I'd have time within it to analyze this restricted definition, but the bulk of objective history to be covered precludes the possibility of exploring the concept behind it. I must, however, observe that the definition is of quite recent vintage, is propounded by individuals concerned with weighty but nonetheless circumscribed problems, and excludes the consideration of many questions of greater gravity. The statisticians have a vital role to play in educational research but not so vital, I think, as some of them imagine.

Those of you who have kept fresh your knowledge of American higher educational history recognize the date 1701 as the year of the founding of Yale. Ten Congregational clergymen of Connecticut got together that year and decided that for geographic and religious reasons they would establish a college in that colony. All but one of the ten were Harvard graduates, and so not unnaturally they sought advice from the Harvard people who gave allegiance to theological ideas consonant with their own. These included the President of Harvard, Increase Mather, and his prodigious son Cotton Mather who thus became the first educational consultants in American history. Both belonged to the conservative group at Harvard, the group then under severe criticism by the liberal group whose successors would lead Harvard into Unitarianism. The Mathers each wrote letters to what the founding Act issued by the General Court of the colony called the Yale "Undertakers." Probably the Mathers also conferred with some of them in Boston. Be that as it may, the founders solicited help in organizing the college they envisioned.

Their study also undoubtedly included a review of the organization of the Scottish universities and of the University of Dublin at which Increase Mather had been a student. I have not been able to find any direct evidence of such a study, but the fact that Yale followed Scottish precedents in establishing a single governing board strongly suggests it. The only two American colleges then in operation--Harvard and William and Mary--each had two governing boards; and since the Yale founders by-passed that arrangement and adopted the one-board plan, it seems to follow that they either had previous knowledge or made an investigation of Scottish methods of academic government. In any case, the Yale founders studied with some care the problem of how to organize their college; and although their research may have been rudimentary in comparison with, say, the Carnegie-sponsored investigation of American academic government currently being completed by John J. Corson, I have no qualms at all in naming it as the first piece of institutional research in American higher education.

An exhaustive audit of the early history of institutional research would almost certainly turn up a dozen or so other eighteenth century studies. I know of several, but I shall briefly describe only the three undertaken by Ezra Stiles who became president of Yale in 1778. Stiles--a Yale graduate and a former tutor there, a lawyer as well as a minister, a close friend of Benjamin Franklin's because of their common interest in scientific experimentation, and considered to be the most learned man of his time in New England--did his first study in 1763-64 and his second and third during the six-month's period it took to make up his mind about accepting the proffered Yale presidency.

He made his 1763-64 investigation in preparation for the founding of Rhode Island College which later changed its name to Brown University. Like the Yale study to which I've just referred, it had to do with academic government. For some years Stiles had been pastor of the Second Congregational Church in Newport, Rhode Island; and when in the summer of 1763 an extraordinary 25-year-old Princeton graduate named James Manning arrived from Philadelphia commissioned to found a Baptist college under his presidency, he asked Stiles to help him design the college's plan of government. Just how much research Stiles and Manning did in drafting their recommendation, I've not been able to discover; but they probably did not a little because their proposal did not resemble the systems of academic government in effect at their alma maters, at Harvard, at the three other American colleges already established, or at any of the Scottish universities from one of which, incidentally, Stiles had an honorary degree. The details of their plan are not significant here, and I refer to it only because the circumstances surrounding its preparation and adoption indicate that Stiles had looked fairly carefully into methods of academic government at home and abroad.

His second study also related in part to academic government, this time to that of his alma mater which in the fall of 1777 invited him to become its president. He wasn't sure that he wanted the post, and so he made an extensive inquiry into the controversy then going on between the Connecticut Legislature and the Yale governing board and also into public opinion about Yale and its problems. He spent six months on the investigation, and concurrently he did his third study. Concerned with the Yale curriculum and entitled "Plan of a University," it appraised the medical courses already being offered at Pennsylvania, Harvard, and Columbia; and it mapped the developments in professional education at Yale which came along during later decades. Together with the 1753 curricular study of Provost William Smith of the College of Philadelphia (the University of Pennsylvania) and that made about the same time by President Samuel Johnson of King's College (Columbia), it constitutes one of the basic documents in the history of American college and university curriculums.

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Leaping ahead half a century brings this necessarily impressionistic review to the first institutional self-survey. It occurred at Harvard and continued for several years in the mid-1820's. A number of vexatious circumstances led to its initiation including the assiduous proposals for curricular and instructional reform of Professor George Ticknor who had recently returned from four years of study in Europe, German in particular; the student uprising known as the Great Rebellion which led to the dismissal of 43 of the 70 members of the Class of 1823; and the demand of a number of professors for membership in the Harvard Corporation, the more powerful of the institution's two governing boards.

Concurrent professorial and student discontent clearly required ameliorative action, and so a network of committees of the Corporation, the Board of Overseers, and professors and also of committees with joint memberships from the three groups set about a wide-ranging assessment of Harvard affairs. From their work issued a series of significant revisions including the complete rewriting of the statutes governing the college, the redefinition of the functions of the president, the creation of a new governing body called the Faculty of Harvard College, the establishment of instructional departments to replace the outmoded system under which the younger members of the teaching staff taught all subjects offered, the institution of a primitive kind of elective system, the sectioning of classes in the modern languages on the basis of ability, and the abandonment of the system of money fines for student misdemeanors.

Of course, no one called the work of examining Harvard's problems 135 years ago a self-survey, but the enterprise would be so designated today. If the committees knew little about educational research techniques and nothing at all about statistics, they did know Harvard. They also sensed the accelerated spirit of change just beginning to course exuberantly through the Western World, and thus they proposed changes which led to more far-reaching results than any present-day self-survey of which I know.

The Harvard committees of the 1820's, I've just remarked, knew nothing of statistics; but in 1839 the American Statistical Association got organized in Boston; and slowly elementary statistical ideas began to diffuse through the nation. In 1870, for example, the United States Government undertook its first well-grounded census; and four years earlier the first statistical study in American higher education seems to have been published, namely, an analysis of the enrollments of ten competing colleges. The author, Frederick A. P. Barnard, had become president of Columbia two years earlier and had discovered that Harvard, Yale, and other colleges were matriculating more freshmen from New York City than Columbia. He therefore set out to discover the facts, and he presented them in a series of tables to the Columbia Board of Trustees as part of his annual report for 1866 and also in a pamphlet intended for general distribution. Four years later he did a follow-up study, and at that time he also made the first careful listing of the colleges of the country and the essential numerical facts about them.

Barnard used only commonplace arithmetical methods in his studies because the advanced statistical concepts of today had not yet been developed and wouldn't begin to impregnate education or any other subject until after the appearance of such books as Pearson's Grammar of Science in 1899 and Bowley's Elements of Statistics in 1902. The fact needs recalling that the multiplex statistical enterprise of today has issued from a number of historic sources and from two in particular: first, from political scientists who coined the term perhaps as early as the sixteenth century and who employed it to denominate their collections of enumerative facts about civil states and their subdivisions, and second, from mathematicians like Laplace who originated collections of enumerative facts about civil states and their subdivisions, and second, from mathematicians like Laplace who originated and fostered the theory of probability. These two streams did not join until Pearson's time, but meanwhile many individuals who knew about the work of the political statisticians began to use their simple arithmetical devices.

Among educators these included not only Barnard but also President Charles W. Eliot of Harvard who took office in 1869 and whose annual reports from the beginning of his 40 years in office abound with statistical tables. They record many varieties of operational facts, but they also reported the studies of Harvard problems which he and his associates undertook. On one issue close to his heart, for example,--the reduction of the Harvard undergraduate program from four years to three--he published several score of tables resulting from his investigations. Incidentally, they did not lead to the result he desired; but they and his other studies and reports seem to me to justify the statement that continuous rather than spasmodic institutional research began at Harvard under Eliot's direction.

An eminent political scientist, A. Lawrence Lowell, succeeded Eliot in 1909; and it seems probable that he became president of Harvard largely because of his institutional research activities. These began in 1902 when he became a member of the Committee on Improving Instruction in Harvard College. This committee, one of the most consequential in the history of American higher education, came into existence because of the growing conviction in the academic world and in the public mind that college students were generally lazy, luxury-loving, and scandalously immoral. I believe the study it undertook to be the first factual investigation of instructional methods conducted by an American college or university. Among other things it inquired into the amount of time Harvard undergraduates spent on their courses and discovered it to be an average of three and a half hours a week per course or about half the time that faculty members considered minimal. It also made the first recorded canvass of class size. Further, it reviewed the system of working for honors and set the stage for the spectacularly successful honors program which Lowell inaugurated after he became president. Finally, its facts and its succinct and skillful presentation of them prepared the way for the soon-to-be-accomplished abandonment of Eliot's widely advertised free-election system.

I have described the work of the Committee on the Improving of Instruction in Harvard College not only because it seems to me to be a monumental study but also because I have never seen it cited in the literature of higher educational research. Nor have I seen references to Lowell's own investigations, the most significant of which had to do with the relationship of undergraduate scholarship to career success. He published one of these studies (College Rank and Distinction in Life) in 1903 and another (College Studies and the Professional School) in 1911, that is, somewhat before and just after he became president. They had enormous influence in helping change the attitudes of Harvard undergraduates toward serious work. Thus when Lowell took office, only a smattering of students took honors at graduation; but their proportions increased to 16.8 per cent six years later, to 37.2 per cent in 1933, and to 42.5 per cent two years after he retired.

Neither Eliot nor Lowell established, I believe, a bureau or office of institutional research; and none has since been created. Nonetheless considerable such research has been carried on and published there. I shall have more to say later about how this has been done. For the nonce I'd like to quote a statement by Lowell and another by his successor, James Bryant Conant, urging the importance of educational investigation. Said Lowell in a 1916 address on "Scientific Study of Education" at Carlton College:

> Education is the last of man's creations to follow the current of the age. At present we know less about it scientifically than about almost any other subject... We ought to pass from the stage of theory, however plausible, to that of scientific knowledge...We should [not] remain in a state of educational chaos for lack of positive knowledge obtained by the methods of modern science.

Said Conant in his annual report for 1937-38:

> There can be no question today that the study of education as a social process--quite apart from the training of teachers--is as important as the study of law or of business administration.

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Thus far I have referred only to developments in the eastern part of the country, and it's high time that those of other sections be considered. Beyond all comparison with anyone in the Middle West, William Rainey Harper, the titanic first president of the University of Chicago, promoted research of all kinds including institutional research. Knowing that he would be invited to be its president even though he had just turned 34 when the University received its charter in 1890, Harper began a comprehensive exploration of higher education at home and abroad. He filled a series of red notebooks now carefully guarded in the archives of the institution, and both his data and his predilections impelled him to steer Chicago into a program in which research would be the loftiest of functions. This meant among other things that promotions in rank and salary would depend, as the contract that Harper required each faculty member to sign, primarily upon "the merits of the research" they "carried out." It also meant, in the words of one of the six college and university presidents who quit their jobs to become members of Chicago's original professorial staff, that "not the least among the problems which the University should investigate was itself." Thus Harper initiated a score or more of history-making educational experiments and also, in season and out, proclaimed the need of educational research.

In 1899, for example, he delivered an address before the Regents of the State of New York entitled "Waste in Education," and among other things proposed that "there should be a diagnosis of each student, in order to discover his capacities, his tastes, his tendencies, his weaknesses, and his defects; and upon the basis of such a diagnosis his course of study should be arranged." Four months later at Brown University he detailed what he meant by "a diagnosis of each student" in a paper entitled "The Scientific Study of the Student." It is a high landmark in the history of student services in American higher education, and I call attention to it to show the range of Harper's vision of educational research.

His vision probably included the whole gamut of educational topics, but he died a little more than thirteen years after the University opened and hence of necessity gave his attention chiefly to promoting his innovations and the general welfare of the institution rather than to conducting or directing educational and administrative studies. He did, however, see that all operational facts about the new university got recorded as witness the dozens upon dozens of statistical tables included in his Decennial Report published in 1903 in a volume of almost six hundred pages.

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At this point I must stop and repeat and then comment upon the definition of institutional research proposed in an early paragraph. It reads: institutional research in higher education constitutes any thorough-going investigation of any topic concerning which a college or university or a group of them collects or seeks to collect data toward the end of improving operations. Two words in this definition need now to be enlarged upon, the words "any topic."

Thus far I have briefly described or alluded to studies on eight topics: academic government, curriculum, the length of the college course, instructional methods, class size, student discipline, enrollments, and the characteristics of students. The topics listed for discussion at this institute include three of these--class size, enrollments, and student characteristics--plus five others: teaching loads and instructional costs, budgetary analysis, faculty research, space utilization, and campus planning. This makes a total of thirteen areas of inquiry already named as belonging within the boundaries of institutional research, and beyond question as many more will be mentioned during the days ahead. In fact, I plan to deal with several additional ones this evening, and hence you'll probably agree that some sort of system of classification should be employed to keep all of us from getting dizzy as the talk turns from one topic to the onrushing next one. This wouldn't be necessary, of course, if institutional research should by agreement be limited to a circumscribed number of topics; but the definition I've suggested includes any topic which a college or university investigates with a view to its improvement. The definition takes in a huge territory which somehow needs to be ordered by means of a system of classification.

For a long period now my chief interest has been the task of formulating such a system, and without elaboration I submit it to you and then use it throughout the rest of this paper. It rests upon two postulates: first, that colleges and universities can best be comprehended by identifying their activities or functions, and second that these can be categorized under three main headings: (1) raison d'etre functions, (2) auxiliary functions, and (3) self-continuity functions.

The raison d'etre functions of higher educational institutions seem to me to be only two--teaching students and investigating the nature of the world and man, that is, education and research.

To perform these sovereign functions or to meet social needs, however, colleges and universities undertake a number of auxiliary functions such as maintaining collections of books and works of art; providing for the physical and social well-being of students; conferring degrees and certificates upon those who have satisfactorily completed courses of instruction; honoring distinguished people by means of honorary degrees, and other such supplemental activities.

Finally come the self-continuity functions, the activities in which colleges and universities engage for the purpose of continuing in operation. These include the innumerable things that people generally call administration--raising money for building, and maintaining the academic plant; searching for and nurturing various kinds of workers from presidents to plumbers; recruiting students; setting up schedules of course offerings; purchasing supplies and equipment; and so on through the long list of jobs that must be done if the institution is to survive, never mind to thrive.

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I have reported a number of studies made in the eighteenth and nineteenth centuries; but with the help of this proffered tripartite classification of college and university functions the history of institutional research can, it seems to me, be plotted more intelligibly. Consider, for example, researches in the self-continuity category. The three topics primarily studied before the beginning of the twentieth century seem to have been academic government, student enrollments, and the structuring of educational institutions typified by Eliot's inquiries concerning the length of the undergraduate course. The investigations made on these subjects before about 1900, however, can fairly, I think, be characterized as elementary. The leap forward came with the maturation of the concept of efficiency which occurred at the turn of the century and which led directly to the widely-discussed University of Wisconsin survey undertaken in 1913-15. Before reviewing that study, however, the rise of the concept of efficiency needs brief consideration.

As far as I've been able to discover, no one has yet told the story of the emergence and spread of the concept of educational efficiency even though it appears to have colored the thinking of almost all important educational writers after 1899, the year that John Dewey and William Rainey Harper each wrote a paper entitled "Waste in Education." My own occasional and quite spotty ferretings into the history of the idea have led me to a number of books and articles on efficiency published before the First World War in both the self-continuity and raison d'etre functions. By all odds the most important of these in the self-continuity category was a volume sponsored by the Carnegie Foundation and published in 1910 entitled *Industrial and Academic Efficiency*. It reported a study made by a young man named Morris Llewellyn Cooke, a disciple of Frederick W. Taylor who originated efficiency engineering. Its subject matter constituted "the cost and the output both in teaching and research in the departments of physics" in six large universities and two small colleges.

Unhappily Cooke's research seems to have been almost forgotten since I don't recall ever having seen it listed in bibliographies. Apparently, however, it had immediate influence at a number of universities, the University of Wisconsin among them. At all events, because of legislative criticism of high educational costs, the University of Wisconsin in 1913 employed one William Harvey Allen to study the "efficiency" of its "teaching and educational methods," including class size, instructional costs, and related administrative problems. Allen, a Ph.D. in political science from the University of Pennsylvania and a member of the staff of the New York Bureau of Municipal Research, had previously written a book on *Efficient Democracy* and had made a survey of the rural schools of the state. He made such a fiasco of the Wisconsin study, however, that criticism of his procedures came from all parts of the country. Dean Elwood P. Cubberley here at Stanford, for instance, called it "an outrageous investigation," and President Eliot of Harvard declared Allen to be "totally incompetent... both as to knowledge and as to judgment," (in Merle Curti, *The University of Wisconsin: A History*).

It seems highly probable that Allen's abortive work at Wisconsin considerably retarded the investigation of college and university administrative problems. So also did the First World War and the attacks on administration and administrators led by James McKeen Cattell in his 1913 book *University Control*, Thorstein Veblen's *The Higher Learning in America* which appeared in 1918, and Upton Sinclair's *The Goose-Step* published in 1923. A few sentences from Veblen's still influential book (it has been reissued twice, the last time just two years ago) show the contempt in which many professors held--and some still hold--the concept of academic efficiency even in the self-continuity functions:

> Men dilate on the high necessity of a businesslike organization and control of the university, its equipment, personnel and routine. What is had in mind in this insistence on an efficient system is that these corporations of learning shall set their affairs in order after the pattern of a well-conducted business concern. In this view the university is conceived as a business house dealing in merchantable knowledge, placed under the governing hand of a captain of erudition, whose office is to turn the means in hand to account in the largest feasible output.

He castigated the concept of efficiency, however, because under it "the faculty is conceived as a body of employees, hired to render certain services and turn out certain scheduled vendible results." It also, he avowed, "puts a premium on mediocrity and perfunctory work, and brings academic life to revolve about the office of the Keeper of the Tape and Sealing Wax."

As every administrator knows, Veblen's point of view continues to have adherents today, but their ratio among faculty members seems to have diminished substantially. Many factors have contributed to the change including the participation during both world wars and the intervening depression of large numbers of professors in the work of governmental and industrial organizations; the proportional increase of faculty members teaching engineering, business management, and the applied social sciences; and the general acceptance by the American people of the concept of efficiency at least in the self-continuity functions of social institutions.

The change, however, has been shockingly slow in affecting operational improvements in most colleges and universities. Not a single institution of which I know, for example, has yet established a unit with more than a very limited commission to investigate administrative practices--that is, its self-continuity functions--toward the end of rationalizing them and cutting costs. Many disparate studies and improvements have been made in alert institutions, but the concept of studying administration continuously has not made significant progress. Further, no organization exists in higher education parallel to the American Management Association; the United States Office of Education supplies higher educational administrators with few aids comparable to those which the Unived States Department of Commerce provides business executives; and colleges and universities can subscribe to practically none of the informational and other services which have been available to business organizations for decades. Finally, higher educational administrative research lags because by and large we follow the sink-or-swim method of training administrators be they presidents, deans, business officers, or heads of academic departments. In tolerating this method and also the less-used apprenticeship system, we fail to attend to the fact that recognition of the importance of research does not come naturally to most people and must be inculcated by specific training.

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The emergence fifty to sixty years ago of the concept of efficiency had an earlier and apparently greater impact upon research in the raison d'etre and auxiliary functions than upon self-continuity investigations. The Committee on the Improvement of Instruction in Harvard College to which I've already referred and which started its work in 1902, set about, for example, to acquire "accurate and detailed knowledge of the methods and the efficiency of instruction"; and in 1908 President Henry Churchill King of Oberlin appointed a faculty committee, called the Committee on Tests of College Efficiency, to make an exhaustive self-survey of the college. Meanwhile Woodrow Wilson had applauded the idea of efficiency in his inaugural address at Princeton in 1902, and in 1904 Eliot at Harvard gave an address entitled "Education for Efficiency" which he later included in a book by the same name.

The term efficiency, however, soon largely gave way in educational as distinguished from self-continuity investigations to the terms the science of education and the scientific movement in education; and under banners bearing these ambitious legends psychologists and educationists began to grapple with a vast span of instructional, curricular, and related problems. Most of them concentrated their effort on the elementary and secondary schools, but a number of circumstances shifted part or all of the interest of some of them to higher education. These circumstances included the development of the Army Alpha and other intelligence tests during and immediately after the first war with Germany, the initiative and generous financial support of the two Carnegie and of other philanthropic foundations, and the appointment of a number of educationists and psychologists to leading university presidencies.

Since unquestionably everyone in this audience knows about the evolution of college-level intelligence testing, I need not linger on it and can move on to the other two factors just named. Consider first the stimulation and funds supplied by the foundations. Henry Smith Pritchett, President of the Carnegie Foundation for the Advancement of Teaching from its founding in 1906 until 1930, and Frederick P. Keppel, President of the Carnegie Corporation from 1923 until 1941, are seldom mentioned in reviews of higher educational research; but should a comprehensive history of it ever be written, they would each rate a long and praiseful chapter because they initiated and supplied the funds for more future-shaping educational investigations than, I think it safe to say, any two other men before or since. Pritchett, for example, proposed and then allocated the money for the Cooke study of industrial and academic efficiency to which I've already made reference; and he also set in motion Flexner's revolutionary study of medical education published in 1910 as well as a score of others which, though less spectacular, had definitive influence on the improvement of higher education. In his turn, Keppel persuaded a group of modern language professors to undertake the famous Modern Language Study which appeared during the early thirties, and--to abbreviate a long list--he also projected extraordinarily influential studies of music and the fine arts. Meanwhile the General Education Board, among other inquiries, had activated the Classical Investigation published in 1924, and the Commonwealth Fund had sponsored a score of studies including Fred J. Kelly's inquiry of the same year into the status, problems, and prospects of the American liberal arts college.

The foundations seem not to have frequently given funds to individual colleges and universities for strictly institutional studies, but the inter-institutional or national investigations that they conceived and patronized encouraged interested presidents to promote educational and administrative research on their own. Time permits me to attend--and only briefly--to the activities of three such presidents, two of them educationists and one a psychologist: Lotus D. Coffman of the University of Minnesota, Edward C. Elliott of Purdue, and James R. Angell of Yale.

Coffman, in my mind the outstanding state university president of his time, had been successively a school principal, professor of education, and dean of the College of Education at the University of Minnesota before becoming president in 1920. In his report to the Minnesota Board of Regents for 1925-26 he devoted twenty-six pages to the subject of investigating the educational activities of the University and to describing the work of the University Committee on Educational Research which he had appointed the previous year. Meanwhile he gave his blessing to the researches in admissions and student scholarship already begun by Dean John B. Johnston of the College of Letters and Science and those of Professor Donald G. Patterson in educational and vocational counseling. Minnesota has been formally investigating its raison d'etre and auxiliary functions longer, I think, than any institution other than the University of Illinois whose Bureau of Institutional Research came upon the scene in 1918. I shall say more about it in just a few moments. Incidentally, Minnesota a decade ago replaced the committee which Coffman established by a unit with the same name as that at Illinois.

President Elliott of Purdue, a close friend of President Coffman's, followed his leadership sixteen months later by organizing the Division of Educational Reference under his immediate supervision to "study the instructional activities of the University, to serve as educational adviser to both faculty and administrative officers, and to publish the results of its labors in the form of bulletins." It has been in operation ever since, and the last of its bulletins in its series of Studies in Higher Education that I've seen bears the number 87 and the date of January, 1958.

President James R. Angell of Yale, the psychologist among the trio of university presidents whose advancement of institutional research I've selected for description, had directed Harry Dexter Kitson's doctoral dissertation on "The Scientific Study of the College Student" while head of the psychology department of the University of Chicago. He had also backed psychological and educational studies during his brief tenure as president of the Carnegie Corporation; and six years after going to Yale in 1921, he created the Department of Personnel Study under the direction of A. B. Crawford. It still functions, and Crawford's significant studies of intellectual incentives, occupational choice, and predicting student achievement have a permanent place in the literature of student clientele research.

Three paragraphs back I referred to the Bureau of Institutional Research at the University of Illinois as probably the first such unit established in any American university. Further exploration may prove this to be an incorrect statement, but in any case W. W. Charters, then Dean of the College of Education there, organized it in 1918 as a service bureau for the central administration. It is still in operation doing studies which a leading professor in 1941--William A. Oldfather, head of the Department of Classics--described as "invaluable" to faculty committees as well as to the President's Office.

Two other Middle Western institutional research structures organized during the twenties also should be cited--the Bureau of Educational Research at Ohio State University and that headed at the University of Michigan by Clarence S. Yoakum. The first of these had been set in operation in 1918 to make school surveys and otherwise to service the schools of Ohio; but when W. W. Charters became its director in 1928, he added two new divisions concerned with institutional research. Both began their work in 1929 with Ralph W. Tyler as head of the Division of Achievement Tests and with me in the parallel post in student personnel research. Tyler worked with instructional departments--especially with the Departments of Botany and Zoology where he made conspicuously significant studies--and I did a few things in my area but chiefly gave my time to doing a wide range of chores for the President and various deans, most of them administrative rather than investigatory. The Bureau still flourishes, but it seems to do rather less institutional research than during the Charters' directorship which ended in 1942.

During this period interesting things were also happening at the University of Michigan where in 1927 Clarence S. Yoakum became director of the newly-established Bureau of University Research. President A. G. Ruthven when he took office in 1929 found Yoakum's studies and personal counsel so valuable that the next year he appointed him Vice President and changed the name of his unit to the Office of Educational Investigations. Yoakum's research waned, however, when in 1935 he added to his duties the deanship of the Graduate School. Thus upon Yoakum's retirement in 1945, the Office of Educational Investigations closed.

Since my direct concern with institutional research ended about the time that Yoakum retired and since this already-too-long paper must be brought to an end, I shall not attempt to review the post-war period. This will probably disappoint Dr. Axt because he wanted me to emphasize the past thirty years, and here I am skipping over the last half of the period. I do want, however, to comment about it briefly and also to make an observation or two about possible plans for the future.

That there have been interesting developments since the end of the Second World War, few will deny; but may I say candidly as a former insider who therefore has a warm interest in institutional research that they do not seem to me to add up to anything approaching a formidable advance. A few new bureaus of institutional research have been established, three regional organizations including WICHE have been organized, and perhaps a somewhat although not impressive proportion of college and university presidents see the need of being supplied with more and better data. The progress made since the upsurge of dynamic interest which animated such presidents as Coffman, Elliott, and Angell and such bureau directors as Charters and Yoakum appears to me, however, to have considerably diminished.

Further, the achievements of institutional research bureaus per se seem not to have been especially noteworthy. What can research bureau people, for example, list for administrators and faculty people as their accomplishments during the recent past? I may be wrong in believing that the list would be short and not especially imposing; but assuming that I am right, what should and can be done about promoting the institutional research enterprise in the broad, that is, whether done by bureaus, by individuals, or by faculty committees? Since I consider it to be within the province of the historian to suggest for the present and the future what the past has illuminated, I conclude by submitting a single but ramified suggestion on the question.

To begin with, someone needs to state the case for institutional research more convincingly than it seems yet to have been stated. Indeed, I know of no adequate address, article, or book to which one might refer a president or faculty member whose interest in it he might want to arouse. It would now be necessary to indicate paragraphs and short sections of several score of publications, and I doubt that many would take the time to run them down for reading. The job of collating the best statements and of distilling them into a new, relatively short, and cogent document will in my judgment need to be done before institutional research will be widely recognized as essential or even important. The historical review attempted in this paper, may I suggest, might help in the location of passages that would be helpful in the writing of the proposed conspectus.

But who will write it? The job requires skills that research people do not usually have in sufficient abundance. I mean the rhetorical skills that by and large those concerned with detailed facts and their minute accuracy do not cultivate. That a few individuals with the necessary abilities exist among institutional researchers, however, seems probable; but they need to be located; and one of them needs to be enticed into undertaking the important task of being the advocate of your enterprise.

Such a proposal raises the question of who will take responsibility for finding such gifted writers and persuading one of them to take on the assignment. The answer seems to me to be that no one will go to that trouble except as a member of an organized group established to advance institutional research in higher education. As far as I know, no such group has yet been projected, and I believe with conviction that you urgently need one for mutual assistance and for promoting your field of interest. It's an historic fact that few undertakings in the academic world--and, indeed, generally--make noteworthy progress until after those concerned with it become associated in order to learn from one another, to undertake common projects, and to persuade those in seats of power to give heed to the immediate and potential values of their work. This has been the situation in every academic discipline from anthropology to zoology, but those concerned with higher education as a subject of study--be they professors of higher education like me or institutional research people like you--have not put this fact of history to work in their behalf.

During the writing of this paper I have made a list of some of the activities in which the proposed association or society of institutional research people might engage besides initiating and publishing the exposition of the crucial importance of their activities which I have proposed. I've decided, however, that this paper has already covered too many pages and, moreover, that it would be more apropos on an occasion especially arranged for an assessment of the field as a whole rather than, as at this institute, for the discussions of unitary problems. I therefore return you from this protracted but much to kaleidoscopic trip through the past to the insistent and challenging present. May your discussions this week of the scheduled problems be profitable and, perhaps, made at least a bit more luminous because of my effort tonight to put them in historical perspective.

II. The Purpose and Organization of Institutional Research

. . . . **John Dale Russell**

Institutional research only recently has been recognized as a major need and function in American Higher Education. At the few colleges where there is a real institutional research program, it is usually even newer than, say, Federal contract research, the housing of married students, or technical cooperation missions abroad.

In this paper I will discuss, necessarily in very summary fashion, some main points about the purpose and organization of institutional research.

Research in the whole field of education is relatively new and developed principally during the Twentieth Century. The universities first did research on problems of education in the public schools, elementary and secondary, and on school administration.

Progressive city school systems began to establish research bureaus, shortly after World War I, to work on their problems. State departments of public instruction also began to establish bureaus of research in the early 1920's, to work on the problems of the elementary and secondary schools.

Institutions of higher education, however, have been relatively slow in establishing offices for the investigation of their own problems and operations by research methods. The whole idea of a research approach to the problems of operating an institution of higher education still does not have wide acceptance. Industry, in contrast to higher education, relies heavily on research to guide its development.

But pressures of expanding enrollments and mounting costs of higher education are forcing many institutions to do research in order to improve the effectiveness and efficiency of their operations. It is uncertain how rapidly such institutional research will develop. Within the personnel of higher education there is great resistence to change and an attitude of suspicion toward research on problems in this field.

The Research Approach

The basic drive in research is to find the facts and to understand them. Research is not only motivated by curiosity, but often by the firm belief that "it could be done better." This is closely akin to "invention."

Objectivity is the keynote of research. Interpretation of the facts may produce differences of opinion, especially on key issues in a field like higher education. But objective research can substitute facts for myths and clear analysis for cloudy prejudices.

There are three major kinds of research in higher education:

1. Studies of status, i.e., descriptions of current practices and conditions.

2. Studies of trends, particularly historical sequences.

3. Evaluative studies, which compare the outcome of different policies and procedures.

Much research has the objective of improving prediction and thus, ultimately, having an effect on human behavior. Institutional research can be expected to cause changes in higher education; this helps explain the resistence to it in major segments of higher education.

In considering institutional research, it is helpful to use the customary distinction between the two broad areas of "basic" (or fundamental) research, and "applied" research.

This distinction can be misused, since there is no agreed-upon, sharp line between the two categories. But it is important to note that most institutional research falls into the category of applied research.

The Nature of Institutional Research

Basic research is carried on solely in the spirit of inquiry, without regard to any practical use or application of its results. There are very few places in the United States (or in the world, for that matter) where any basic research is being done on higher education, except as it may arise out of institutional research.

The major centers where some basic research is done on higher education are:

1. The U. S. Office of Education.

2. A few of the endowed foundations (usually they make grants for specific projects).

3. The accrediting associations (probably less than in the past).

4. A limited number of universities.

Applied research is directed toward some immediately or ultimately useful application. Often, research on some practical problems results in generalizations that are of much wider application than the problem to which it was originally directed. And sometimes the search for an answer to a practical problem requires supplementary research on the techniques of investigation or even the invention of new techniques. It is in these ways that some basic research on higher education arises out of applied institutional research.

Institutional research is a form of applied research. The initiation of a research project of this type is nearly always stimulated by the desire to find an answer to some practical problem. (E.g., why do so many of our students leave college before they earn a degree?)

The results of institutional research often have application beyond the immediate institutional setting in which the research is conducted. Generalizations from studies may be verified by repeating them in different institutional settings. Many institutional research studies should be published, so that the findings can be made generally available. We are seriously lacking at present in facilities for collecting, and, especially, synthesizing the results of research studies in higher education.

Institutional research is directed toward important problems of the individual institution. But there is a tendency also to assign to the institutional research agency, where this has been set up as a separate office, the responsibility of answering all questionnaires and making statistical reports. This is not "research," if it involves only the compilation of readily available data. (Much could be said about the questionnaire nuisance.)

One can raise a question about the point at which the routine collection of data ceases to be research.

The first time the data are organized to point toward the solution of a problem, it is properly considered a research project. Repetition of previous studies to improve techniques is also a legitimate use of research talent. Interpretations of trends from repeated studies may also involve a research approach.

But the mere repetition of a study that is needed annually in the ordinary process of administering an institution ceases to be research. The data may still be very useful for administrative purposes, but research talent is not needed to collect and analyze the data.

Thus, one of the functions of the research agency in the institution is continually to work itself out of a job, farming out routinized studies to other agencies in the institution, and constantly developing new areas on which research seems likely to be profitable.

John Dale Russell

The Organization of the Institutional Research Program in a College or University

At least four basic patterns may be distinguished in the organization of institutional research:

1. The comprehensive institutional self-study or survey, usually "one time" or at long intervals.
2. A diffused assignment of small responsibilities for research studies to some of the regular staff members of the institution.
3. The faculty committee on institutional research.
4. The office of institutional research as a part of the central administrative structure of the college or university.

The office of institutional research is generally headed by a director responsible to the president or some other high-level official of the institution, such as a vice-president or provost. The office of institutional research exercises a staff function, not a line function.

Research under such an organization tends to be administration-oriented, and suggestions for projects originate commonly with the members of the administrative staff.

The four kinds of organization are not mutually exclusive, but may exist in various combinations. For example, some institutional research offices have a faculty advisory committee. This can be useful not only in gaining faculty cooperation on certain kinds of research but in getting suggestions for needed studies.

Also, the office of institutional research can encourage an orderly, rather than diffuse, assignment of research responsibilities to regular staff members of the institution.

It is important that the work of institutional research be adequately supported by budgeted funds. This is facilitated by the organization of a definite office of institutional research.

The office of institutional research should be attached at a high administrative level (president or vice president), so that:

a. It can have access to all necessary institutional data;

b. It can deal broadly with problems in any phase of institutional operations.

c. It can make its voice heard in the need for budgetary support.

John Dale Russell

The plan of using an organized office of institutional research has the advantage of fixing centralized responsibility for the use of funds for institutional research. The organized office of institutional research can coordinate the activities of various offices and agencies in institutional research by allocating funds from its budget to support their research projects.

The budget of the office of institutional research should, therefore, be adequate not only for the research projects it carries on itself, but to provide funds that may be allocated to other agencies and staff members to support their research on institutional problems.

There are several requirements of an agency given the task of directing the program of institutional research:

1. Competence to carry on research in higher education.
2. A reasonable knowledge of research already accomplished, to avoid needless or pointless repetition of studies.
3. A thorough knowledge of sources of general statistical data and other basic information about higher education.
4. Time enough to devote to the research activity. It cannot be done by a busy official with his left hand while his right hand is busy at other inescapable tasks. An adequate staff is also essential.
5. A deep-seated and abiding interest in research, and a faith in research as a process--there will be plenty of discouragements.
6. A cooperative spirit in working with others, including both faculty members and administrators.

Some Concluding Observations

The area of institutional research studies is as broad as the entire operation of the institution. No subject is sacred from investigation by research methods.

I will simply list some topics for institutional research:

1. The students
2. The alumni
3. The faculty
4. The curriculum
5. The instructional program
6. The library
7. Instructional materials
8. The physical plant

9. Research activities
10. Public services
11. The financing of the institution
12. The administrative structure and controls
13. Administrative policies and procedures

Perhaps the important consideration in developing an institutional research project is to have a feeling for it as a real problem. Don't undertake a study just because someone else suggests it as a good area for research.

It is important, moreover, to allow plenty of "lead" time to carry on the research, if the results are to be used in some practical application at a fixed date in the future.

Finally, we must remember that research does not make the decisions on courses of action. It only affords a basis on which sound decisions can be made. It does not supplant the need for sound administrative judgment, but only makes that judgment better informed and more intelligent.

Given the magnitude of the problems facing the trustees and the chief executives of our institutions, an adequate, well-organized institutional research program is a necessity for every college and university.

III. Institutional Research at the Universities of Colorado, Wisconsin, and Minnesota

University of Colorado . . . . . James I. Doi

The Office of Institutional Research at the University of Colorado has its origin in a faculty committee report on administrative reorganization, prepared in 1956. This committee recommended that there be appointed a Director of Institutional Research, whose responsibilities would be to assist the President in the following ways:

"1. Conduct research related to legislative appropriations.

2. Conduct research related to any phase of University education, administration and operation.
   - a. In exercising this function, the director shall secure qualified personnel either from the University staff or outside sources and coordinate their efforts in special areas of research.
   - b. He shall make continuing research studies relative to effective control and general University improvement.

3. Any other type of research required to meet the needs of the University."

Shortly after publication of the committee report, the Regents of the University of Colorado engaged the services of a management agency to study the institution's administrative structure and to suggest how it might be reorganized. The management agency also recommended the establishment of an Office of Institutional Research. The statement of the management agency is cited below;

"Director of Institutional Research. In light of the rapid growth of the University, both in size and complexity, now being experienced and which will in all probability continue into the foreseeable future, there must be a continuous evaluation of existing programs, procedures and methods and a constant search for better ways of conducting University operations. Maximum utilization of faculty, physical plant, equipment and other resources in the achievement of education and research objectives cannot be realized without systematic study and appraisal. The possible savings in resources cannot be estimated, but there are sufficient examples of waste resulting from the lack of such organized research to suggest that they could be considerable. For this purpose there should be a highly trained person in the Office of the President giving his undivided attention to this function. Some such efforts have been and are being made by special committees and by the Assistant to the President; these persons are deserving of much credit, and they, more than any others, realize the need for more formalized and permanent arrangements for the conduct of this important work."

On the basis of the recommendations in these two reports, the University of Colorado established an Office of Institutional Research in July, 1957. Its director is a member of the staff of the President of the University.

One year later, at the request of the Director of Institutional Research, there was established an Administrative Committee on Institutional Research. This Committee functions in an advisory capacity to the Office of Institutional Research on policies and programs. It also assumes an administrative role in the organization of special University self-study committees, coordinates the activities of these committees, and controls their budgets. Its membership includes: Vice President for the University, chairman; Dean of Faculties; Director of Budget and Planning; Secretary of the University and of the Board of Regents; Dean of Students; Director of Libraries; Director of Admissions and Records; two faculty members; and Director of Institutional Research, executive secretary. Chairmen of special University self-study committees also sit as members of the Administrative Committee on Institutional Research during their tenure.

A general policy of the Office of Institutional Research is to encourage each University unit directly responsible for a given area to assume responsibility for studies of its problems and needs. This policy, it is believed, insures maximum use of research results and at the same time stimulates the professional growth of staff members who make the studies.

The Office of Institutional Research generally undertakes a study only if the unit directly concerned does not have the necessary staff to do so, if the study, by its very nature, can best be done by individuals not directly concerned with operational problems, or if it pertains to a University-wide problem that is not the specific concern of any one office. Questions involving assignment of responsibility for the needed research are resolved by the Administrative Committee on Institutional Research.

In actual practice, the Office of Institutional Research gives technical advice to practically all University units undertaking studies of their problems and needs; the degree of participation varies from study to study. In some cases, the Office of Institutional Research determines the research design; in others it may confine its participation to review of plans or preliminary drafts of final reports. In the case of self-study committees--i.e., the study of College of Engineering, the study of Physical Education and inter-collegiate athletics or the study of the University Extension--the Director of Institutional Research participates as an ex officio member.

The Office of Institutional Research for the University of Colorado also functions as the research agency for the Colorado Association of State-Supported Institutions of Higher Education, a voluntary group of seven colleges and universities. The Director of Institutional Research holds the title of Director of Studies for the Colorado Association. In this latter capacity he reports directly to the Association. Approximately 60 per cent of the operating budget for the Office of Institutional Research is prorated to the Colorado Association.

It is hoped, however, that this arrangement will be temporary and, as soon as circumstances permit, that the functions of the Office of Institutional Research for the University of Colorado can be separated from those for the Colorado Association of State-Supported Institutions of Higher Education.

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III. Institutional Research at the Universities of Colorado, Wisconsin, and Minnesota

University of Wisconsin . . . . J. Kenneth Little

A. History

An Office of Institutional Studies was established at the University of Wisconsin in September, 1957. Its creation followed the establishment of the Coordinating Committee for Higher Education, an agency created by the Wisonsin legislature for state-wide planning and fiscal control of the over-all programs of education and building facilities of the state-supported colleges and universities. The legislation creating the Coordinating Committees provided that administrative and technical staff would be assigned from the staff of the state colleges or the university.

Studies initiated by the Coordinating Committee sought much information about each institution. Some of these studies were of a one-shot nature; more of them were designed to provide data annually, or biennially. Such information had previously been gathered from miscellaneous university sources--the registrar, the admissions office, the secretary of the faculty, the controller, the news information service, and the alumni office. Special studies were undertaken and reported only as the various offices conceived them, or as requested by the university administration.

The need to assign research personnel to represent the University on the staff of the Coordinating Committee provided a natural circumstance for the creation of an Office of Institutional Studies, the director of which might serve both functions: (1) assisting in state-wide studies; and (2) developing the institutional information and studies required by university participation in the activities of the Coordinating Committee.

Interest in institutional studies had been growing within the university administration, and discussions of the need for such activity had been sensed before the establishment of the Coordinating Committee. In fact, a comprehensive self-study of the functions and policies of the university in which many of the faculty and administrative staff participated had recommended the creation of an office of institutional studies as a part of the president's administrative offices. The legislation creating the Coordinating Committee was responsible for fostering the establishment of this university function, but it is probable that the university's own needs would have soon led to its establishment without this impetus.

B. Organization

At the time of its creation and at present, the functions of the office were and are open-ended. The Office is responsible to the President, and gathers such information and conducts such studies as will assist the University Administration and/or faculty in its policy formulation and decisions, and performs any other related assignments which the President may direct. In its brief history, the major activity of the Office has been participation in state-wide studies of the Coordinating Committee.

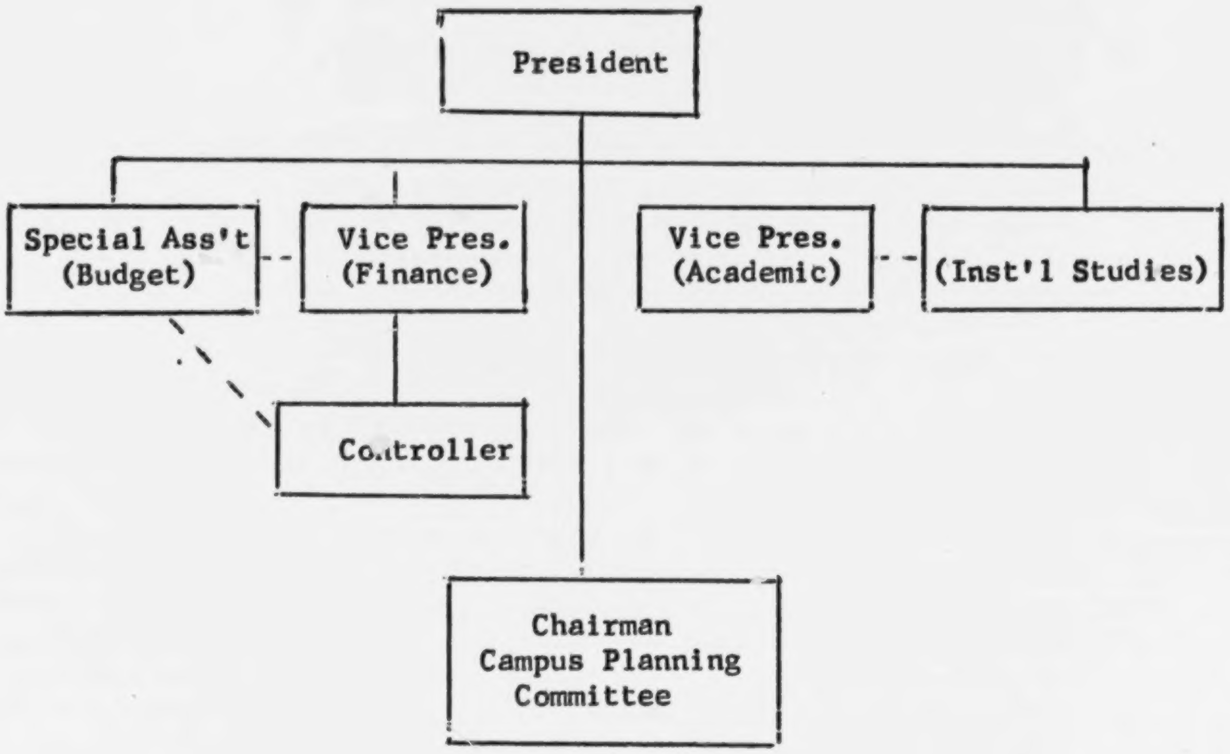
A special assistant to the President has for several years been assisting with the development of the University budget requests. This officer calls upon other university offices for supporting information, but operates independently from the office of institutional research. Information about faculty salaries, student-instructor ratio, and financial data are developed by this officer and the Controller.

Similarly, institutional problems relating to campus planning and building requests are assigned to a small staff directed by the Dean of the College of Engineering, who also serves as Chairman of the University Campus Planning Committee. Studies of space utilization and needs are performed by this group.

To date, the Office of Institutional Studies has concerned itself primarily with studies of students, faculty, and instructional matters, and works most closely with the Vice-President of Academic Affairs.

A new university administration is considering its total administrative structure, and the present organization of institutional research functions should be considered as transitional. There is a present commitment, however, that the function represented by the institutional research office is a necessary one, and therefore will likely be a permanent new member of the administrative family.

The following diagram indicates the organization of institutional research within the University administrative structure.



C. The Staff

Until July 1, 1959 the Office of Institutional Studies was composed of a director and his secretary, with provision for part-time clerical or statistical assistance. Now, a full-time professional staff member and supporting clerical assistance are being added. They will be responsible for assembling and collecting institutional information, developing standard or periodic reports of statistical data, completing administrative reports, and assisting with special studies requested by the university administration or faculty committees. Their primary function will be to collect and have readily available in usable form complete, authentic, and reliable statistical information about university operations. This function is conceived of as providing a centralized reservoir of commonly needed information, particularly data of a recurring nature.

D. Types of Studies

Administrative and faculty members find the Office a convenient source of information and use it regularly. The studies that have been conducted have varied in depth and scope. The following studies illustrate the major types of activity to date:

1. A study of the activities of university graduates. How many continue education beyond the bachelor's degree? at Wisconsin? elsewhere? Where do they get jobs? in Wisconsin? elsewhere? Starting salaries.

2. A study of the persistence of academically talented students in the University--areas of heaviest attrition and persistence.

3. A study of non-university sources of scholarships held by university students, importance of scholarships to university attendance, extent of borrowing and other self-help.

4. The educational background and teaching experience of graduate students who are teaching assistants, by field and comparison with research assistants.

5. The quality of entering students as measured by high school achievement and scholastic aptitude test score, a comparison with students 25 years ago.

6. The transfer students--collegiate origins, home origins, quality measures.

7. Analysis of classes--number, size, type of instruction, and rank of instructor.

8. Characteristics of students who were dropped for scholastic deficiency.

9. The Faculty--origin and degrees.

10. A comparison of those in the 1957 graduating class who were members of the 1953 entering class with those who discontinued before graduation.

11. A follow-up study of highly able students who discontinued study at the University, reasons for discontinuance, patterns of difficulty in university study.

12. Patterns of student difficulties with university studies, relationship to marking practices.

13. Variations in marking practices between and within departments.

14. Analyses of enrollment and enrollment trends.

III. Institutional Research at the Universities of Colorado, Wisconsin, and Minnesota

University of Minnesota . . . . John E. Stecklein

History

The admonition, "you don't know what you're starting," would have been uncommonly apt for Mr. Louis B. Wilson, Director of the Mayo Foundation when, in 1922, he suggested to Lotus B. Coffman, then president of the University of Minnesota, that the University hold a conference to discuss the improved selection of students who desired to enter medicine and other professions. For it was from this oblique beginning that the 37-year-old program of self-study and the Bureau of Institutional Research at the University of Minnesota stemmed. As a result of the letter from Mr. Wilson, President Coffman appointed a special Committee on Educational Guidance to consider the proposal. It did not take the committee long to discover, however, that it knew very little about students, either before, during, or as a result of, their university training, and even less about testing or educational and vocational guidance.

After nearly a year of study the committee recommended that the president of the University appoint an educational research committee to promote the study and investigation of educational problems within the University. The immediate purpose of the research committee was to be the coordination of research being done by individuals in the University, advising in regard to the direction which research should take and the methods to be employed, and promoting the dissemination of resulting information throughout the University.

As a result of this recommendation, President Coffman appointed a 14-member committee in 1924, which consisted of most of the college deans and certain key members of the teaching staff. Melvin E. Haggerty, Dean of the College of Education, was named as the first chairman of the newly formed University Committee on Educational Research. Dean Haggerty remained as chairman of this committee until his death in 1937 and most of the original members also served during this entire period. After Dean Haggerty's death, T. R. McConnell served as chairman of the Committee for about ten years. In 1948, the name of the unit was changed from the Committee on Educational Research to the Bureau of Institutional Research. Ruth E. Eckert, who had been directing the work of the central office since 1940, was named coordinator of the Bureau of Institutional and Educational Research (the latter a research unit of the College of Education), and an associate director was named for each bureau. Robert J. Keller, who was named associate director of the Bureau under Dr. Eckert, became the director of the Bureau of Institutional Research in 1950. Since that time the Bureau has been headed by its own full-time director, although office facilities, equipment, clerical staff, and some other personnel have continued to be shared with the Bureau of Educational Research.

When the Bureau was set up in 1948, the faculty committee became an advisory committee to the director and a standing committee of the University Senate. In contrast to the earlier years, recent members of this advisory committee have tended to be teaching faculty rather than deans, with nearly all of the areas of the University on all three campuses represented by its 14 members.

From its inception, the earlier Committee on Educational Research considered itself to be a faculty research unit rather than a group set up to do special research for the administration. As a result, research studies of immediate interest to members of the University's administration, sometimes referred to as administrative research studies, were conscientiously avoided and left to other units. However, the pressures of World War II were responsible for two large scale studies carried out by presidential request in the early 1940's--a curriculum survey and a faculty load study.

Increased demand for the Bureau's services led to the formation of an Administrative Research Unit within the Bureau in 1956. Additional staff and budget were made available to support these new research activities; they were provided, however, in keeping with the belief that faculty control of the research activities of the Bureau should continue, and that administrative research activities should not dominate the attention of the Bureau staff.

Organization

The role of the Bureau of Institutional Research at the University of Minnesota is stated in the Faculty Handbook distributed to all new staff members as follows: "The Bureau of Institutional Research is a special research unit maintained by the University for the study of its own educational and administrative problems. It is a fact-finding organization with no responsibility for modifying university instruction or administration. It seeks only to discover through scientific inquiries the answers to problems that arise in the educational work of a great university......

"...The Bureau offers consultative aid to individuals and staff groups pursuing the study of special problems, provides the proper facilities for many kinds of educational investigation, and conducts experimental research on approved projects.

"(It) is a research-service unit maintained especially for the faculty of the University of Minnesota. Faculty members are cordially invited to use it."

The Bureau is an independent, all-University unit directly responsible to the academic vice-president. It consists of two units, a general educational research unit and an administrative research unit, coordinated by the Director and an office supervisor.

From a beginning where projects were conceived, developed, and conducted by a committee of faculty members working with special appropriations and with part-time clerical and student help, institutional research at the University of Minnesota has grown into a formalized Bureau with a full and part-time staff of 16 persons. The staff is comprised of five full-time professional staff members (in addition to the director), seven part-time positions for graduate student workers, an office supervisor, and two secretaries.

In the early days of the Committee on Educational Research, faculty members would propose research studies to the Committee and if the Committee found the proposal to be of substantial worth, it would recommend an appropriation to cover the necessary expenses of conducting the study and to cover, in some instances, the cost of relieving the teacher of part of his teaching load in order to conduct the research. In those days, special appropriations had to be obtained from the president's office to cover such expenses, but after 1938 when the committee received its first listing in the University printed budget, project allocations were made without special request. As the size of the University has increased, however, a smaller proportion of the Bureau's studies has been conducted with individual faculty members, and a larger proportion in cooperation with faculty committees or as a Bureau-initiated project. Today, research proposals may come from individual faculty members, faculty committees of the various colleges, the University Senate, standing senate committees, deans or department heads, the president or other members of his central administration, or from the Director and members of the Bureau staff.

Because the order of priority has been on the problems of the University first, on higher education in Minnesota second, and on higher education in the nation third, invitations from governmental or other outside agencies to seek contracts for special research studies, have been consistently declined, and the Bureau has actively sought such a grant only once in the past twelve years. The policy has been to avoid any outside contract commitments unless they fit especially well into the current research interests of the Bureau.

The costs of research studies are covered almost entirely from the Bureau's budget. In certain instances cross-charges are arranged to cover unusual printing or mailing costs, or other out-of-the-pocket expenses, but aside from these, all costs of services of the professional staff of the Bureau, clerical assistance, and costs of writing and producing reports are borne by the Bureau's budget.

One *important* function served by the Bureau which is easily overlooked is that of providing educational research experience for graduate students. It is possible for qualified individuals to begin with a half-time research assistantship and move up to a half-time or even a full-time research fellowship with the Bureau. Graduate student who fill these part-time positions are usually students majoring in educational psychology, psychology, sociology, or statistics.

Types of Studies

As might be expected from the origins of the Committee on Educational Research, research emphasis during the first 15 years of the Committee was on studies of student personnel, student selection, testing, admissions, and retention. This is not to say that some studies of class size and *faculty characteristics*, among others, were not also conducted, but the primary focus was upon the students. During the 1940's, studies of students and testing practices continued, but increased attention was given to problems of curriculum and instruction. With the increasing development of the Student Counseling Bureau at Minnesota, which has assumed continuous responsibility for research on students, the Bureau's research emphasis on curriculum and instruction and on studies of faculty and staffing has increased.

As the Bureau is now constituted, its scope of institutional research is essentially unlimited. However, because certain kinds of institutional research have traditionally been conducted by other university departments, the Administrative Research Unit has purposely avoided any encroachment upon activities which other units might consider to be their special domain. The Bureau frequently cooperates with these other units, however, in making analyses of costs, budget allocation, faculty load, enrollments, or student characteristics. As a result, institutional research at Minnesota is not completely centralized in one unit.

The Bureau also provides leadership in certain studies involving *all* institutions of higher education in the state of Minnesota and in research in higher education for the state legislature. One example of the first service is the annual enrollment forecast and attendance report made by the Bureau. Another example is the proposed state-wide cost and statistical study designed by the Bureau, to be conducted in cooperation with the Association of Minnesota Colleges. The volume *Higher Education in Minnesota* reports a series of research studies conducted by the Bureau for a legislative Commission on Higher Education, and represents service to the state which is typical.

Projects currently underway or in the design stage include the following: (1) an evaluation of the School of Architecture program by all registered architects in Minnesota; (2) evaluation of the effects of the use of dental assistants upon the attitudes and productivity of dental students; (3) a study of faculty attraction and retention; (4) a class size experiment in accounting; (5) honor students' perceptions of college teaching as a career; (6) differential attitudes and interests of college and university faculty members; (7) comparative analyses of faculty activities; (8) a developmental analysis of budget allocations during the past 20-25 years; and (9) a pilot study to determine how college teachers set their levels of expectation concerning the work and achievement of their students, and how these levels differ. Attempts are continually being made to broaden the scope of activity, both in types of study and in the areas of the University involved.

Conclusion

The involvement of the faculty in the development of the institutional research program at Minnesota has resulted in an atmosphere of understanding cooperation with the Bureau's research requests--both general and administrative--which is not easy to come by. Too often, in my estimation, if any institutional research is done, it is done by and for a member of the administration, and the faculty resents such research, not because they think it is unnecessary, but because they do not feel that they are a part of such research, except as it is imposed upon them. In my estimation, a sound institutional research program best serves an institution if at least as much service is provided to the faculty as is provided to the administration, and if faculty participation is ensured in the research program. In this way the administration's benefits are both direct and indirect.

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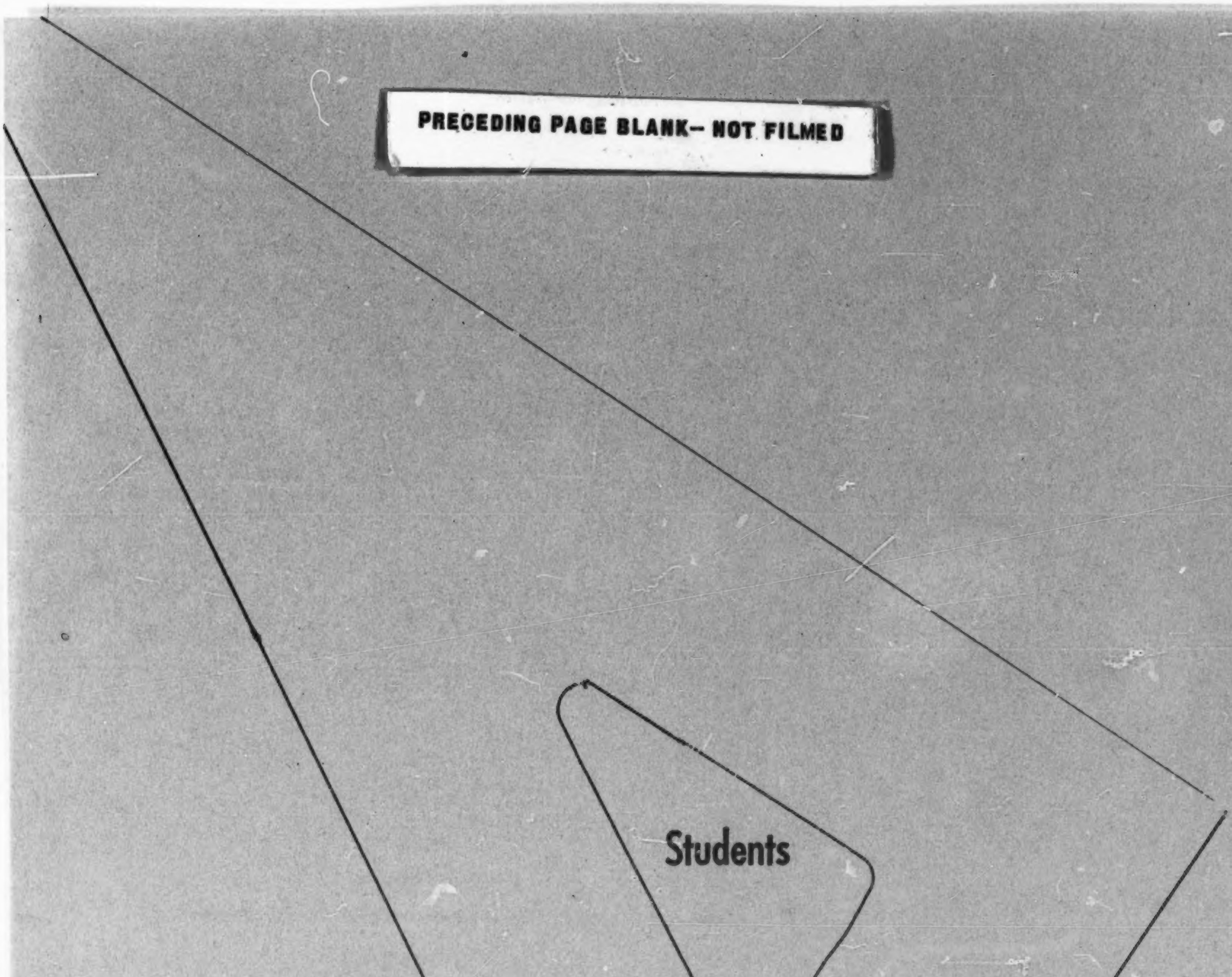

Students

IV. Implications for Institutional Research of Studies on Student Characteristics

. . . . **Paul C. Heist**

Some of you perhaps remember seeing a cartoon in one of the more prominent magazines in which a father puts down his newspaper, glares at his son who has recently returned home from college, and asks, "What are they studying in college these days besides you?" At the Center for the Study of Higher Education at Berkeley we have also come to feel at times like this father, and humorously refer to "the new subject matter in education," namely, the college student. I will not list or describe the few rather extensive studies of the past decade or two, or some of the increasing number of studies of the past three or four years, which have as their major concern the characteristics of students and the changes in such characteristics. Many will be acquainted with the report by Phillip Jacob, Changing Values in College, in which he reviews and summarizes such research up to the year 1956. Certainly the Jacob publication must be credited with having aroused concern for the values and attitudes supposedly accruing from education.

Not necessarily in contradiction with the trend implied in the above comments, I noted in reading the WICHE report titled Institutional Research in the West that studies of student characteristics were not flourishing in most western institutions. Twenty-four per cent of all research projects and studies reported through the questionnaire did in some way deal with students, but only 17 studies were completed or under way in which characteristics other than level of ability or degree of achievement were the major variables. Thus, only 11 to 12 per cent of the research dealing with students examined attitudes, interests and personality traits; this may be a slight over-interpretation, but in the remaining 89 per cent of the studies the titles indicated that these were specific to the two old stand-by variables, scholastic ability and achievement. The 17 studies noted amount to 2.8 per cent of the 600 stuides reported on all aspects of institutional research, and many of these were limited to subgroups or small samples of students on any one campus. Longitudinal research, that is, analysis of development or behavioral changes over time, was reported in only 4 of the 127 institutions.

One would have to confess to some amazement regarding these facts, even when allowing that this study is based on an incomplete sampling. If one doubled or tripled the 2.8 per cent, one could still infer a limited concern with evaluation (at least evaluation more broadly conceived) for the immediate product of education, the individual student. For a great many schools, the aforementioned question of a father to his son does not yet have any relevance. This is not to imply that there is no value in the fairly numerous predictive studies and all those using academic ability measures, grade point averages and achievement test scores.

Undoubtedly, the course grade and grade point averages will continue to serve as chief criteria of college success. But the handwriting seems to be on the wall for expansion beyond this area of great replication. Joshua Fishman recently reported in a paper on "Non-Intellective Factors as Predictors, as Criteria and as Contingencies in the Selection and Guidance of College Students: A Socio-Psychological Analysis" that the results from a survey conducted by staff of the College Entrance Examination Board on all selection and guidance studies in the 1948-1958 decade show that over 70 per cent of the studies dealt with intellective variables; that is, ability and intelligence test scores, achievement test scores, high school rank, and various compilations of grades. But he believes that the 29 per cent of research in this past decade which did include one or more *nonintellective* variables is a sign of a new and important trend. He predicts in the paper that this trend "will become accentuated in the decade immediately ahead." A number of major multivariable projects presently under way, both in single institutions and across a number of institutions, lend support to Fishman's conjecture.

Another sign of the times is the provocative activity in the past year of the Committee on Personality Development in Youth and its subcommittee on College Peer Groups, sponsored by the Social Science Research Council. Possibly a "new tomorrow" in education has arrived. The time seems opportune and the need is repeatedly being expressed for more comprehensive ways of assessing and evaluating the gains and changes resulting from the college experience. Harold Webster and myself, in a paper on "Differential Characteristics of Student Bodies with Implications for Selection and Study of Ungergraduates" have argued, along with others, that new and improved measures of attitude, motivation and personality traits might serve as useful predictors and criteria of college success. Such measures might well be utilized in research on applicants and entering students, in research leading to refinement of selection procedures, and, pending validation within specific institutions, in facilitating the differential education of students.

These opening remarks represent a plea for more broadly conceived and more comprehensive research on students and student characteristics and on the influence and impact that make for the most effective and most meaningful education and change. Following is a presentation of some rationale for this plea.

Values of Inter-Institutional Research

Most of the present research at the Berkeley Center on colleges and college students is best described as inter-institutional as compared to intra-institutional. Work of the former type in no way obviates the importance of the latter, and the objectives might well be identical or similar for much of the research of both types. However, there are certain fairly obvious advantages inherent in research across several or many institutions.

Total classes in numerous institutions represent an adequate population about which data can be collected; the researcher avoids work with unrepresentative small numbers of students in any of a variety of analytical subcategories. This is a distinct advantage when employing the multivariate analysis approach of the sociologist or when attempting to match samples on several variables at once. Further, use of several or more colleges provides essential "controls" for more meaningful analysis of any one college.

Of more importance and direct pertinence for the individual institution participating in research across two or more schools are the comparative analyses permitted: e.g., comparisons of total student bodies, total entering classes, or other more specific student subcultures; analyses like Burton R. Clark's in "The Influence of Organization Image on Student Selection" of the reasons for students' selection of different institutions, the processes by which selection is made, and the effect of selection procedures on the varying student bodies; or, the impact of different schools on individuals of similar and different characteristics. The matter of varying productivity among colleges, especially in those graduates following intellectual or academic pursuits, can only be analyzed by involving schools of some variation in productivity. In one of the present projects at the Berkeley center, a diligent attempt is being made to discover the contributing factors underlying the much greater production of scholarship in a relatively small number of colleges and universities in our society.

The examination of many other problems and questions is enhanced by a more comprehensive inter-institutional approach. Study of creative activity and its possible development in college youth almost necessitates investigation of a variety of educational environments. Studying the development of students of superior ability or with particular talents and the factors which facilitate their best efforts can only be done through sampling at a number of colleges. The problems of underachievement or academic failure, of high withdrawal rates, and of student decisions regarding academic major and future vocation have all grown in importance as we attempt to be more discerning about whom to recruit or admit to our respective halls of learning. They, too, are best attacked through an inter-institutional approach.

Paul A. Heist

Large Scale Data Collection

The methodology, the tools of assessment, and the problems of analysis in social science research are imposing and expanding topics, of and by themselves; this is true whether a sample be large or small, whether the field of study is one school or many. To use a single example, what one might view as the relatively simple problem of reliability of measurement, presumably once resolved as far as many were concerned, is presently undergoing considerable revision at the hands of a number of measurement experts. I would cite as cases in point two articles: Harold Webster's "A Generalization of Kuder-Richardson Reliability Formula 21" and Frederic M. Lord's "An Approach to Mental Test Theory."

Further, members of our own research team at the Berkeley Center would urge that investigations on human variables which are important in an educational context be planned within some theoretical framework. Though admittedly there may seem to be only limited agreement on any general system or body of theory, even within a single discipline in the behavioral sciences, the recent work of several research organizations in the design of studies and in the formulation of questions and hypotheses indicates that representatives from education, psychology, sociology and anthropology might agree on some basic theoretical understructure or perspective. Studies involving a comprehensive approach and some common theory regarding human development and change will allow for more complete answers to whatever questions are raised. To be of value, studies of students need not necessarily incorporate the help of persons from several disciplines; however, consultation with these persons would seem to be a positive step in the attainment of more unified theory and more meaningful and fruitful data.

Any research on students in the college or university domain--whether on the type of students drawn or selected, on students' choice of various major programs, on student failures and withdrawals, on the changes and attainments of those that stay, or on the characteristics of those that continue in graduate work--should be related to the objectives of the institution, to the objectives of a specific major department and to the function of education in our total culture and the various subcultures. Only through such rigorous research planning will most institutions redefine their purposes to fit conditions in our rapidly changing world.

The tools or instruments of research exist in great abundance. Inventories, tests, check lists and rating devices are available in an almost unending variety, most of which lend themselves to administration with large groups. Questionnaires, opinionnaires and schedules are to be had for the asking. Unfortunately, the reliability and validity of many of these measuring devices leave much to be desired. The use of any single inventory or questionnaire requires a check on the information and the results obtained through the use of other approaches and other measures of the same behavior. Second only to the objectives and design of research, much thought and foresight must be given to these means of measurement and assessment.

Some of the established and well-known measuring devices are inappropriate for research in an educational setting, chiefly because of their construction for other purposes; therefore researchers in higher education have developed or assembled new instruments. A few examples of this trend are the following: George Stern's revision of the major variables on the Inventory of Beliefs (described in his book, Methods in Personality Assessment), and his more recent development of the Activities Index, as described in his Preliminary Manual for the Activities Index and College Characteristics Index; Robert Pace's development of the College Characteristics Index, discussed in his A Criterion Study of College Environment; the development of the VC Attitude Inventory at Vassar, explained by Harold Webster in VC Attitude Inventory and VC Figure Preference; and the work on the Omnibus Personality Inventory at the Center at Berkeley explained in the Manual for the Omnibus Personality Inventory by Phoebe Williams and myself, and in "Construction of a Multiple Trait Personality Test for Use with College Populations" by Harold Webster and myself.

Partly through a concern with high ability students, but also as a result of contemplated research on students in general, the efforts of a number of our staff have gone into building and refining a personality inventory, several questionnaires, and a number of other subsidiary devices. Both the personality inventory and the questionnaires contain a number of scales and items with specific relevance to attitudes and motivation toward intellectual goals and to other behavior theoretically significant in an academic situation. Illustrative data from one of these will be presented in the latter part of this paper.

For the most efficient and meaningful research, a great deal of attention must be given to the design of studies and projects. "Getting the facts" in any area is a process plagued with evanescence and delusion. The general design must contain provisions for "controlled" comparisons and a variety of approaches to the same behavior, both referred to above. At the Center, for instance, when we identify potentially creative students (or failing students, or withdrawing students) at several campuses, and then attempt to assess their behavior and its changes, we work in both a cross-sectional and longitudinal fashion, and we employ several measuring techniques.

Studying Students and Student Characteristics

Students are the chief commodity of the educational venture, even though growing attention to a variety of seemingly tangential efforts might lead us to wonder if students are not somewhat incidental to the over-all process. To iterate the point of the introductory remarks, the study of college students in any comprehensive sense, or of groups of students as cultures or subcultures having potential impact for change, has a rather meager history; but we now seem to be in a transitional period and in the next decade greater funds and much energy will be expended on investigation of many aspects of student life.

Sound and legitimate reasons for studying human beings are certainly not difficult to derive, and it is therefore all the more amazing that this wealthy area for observing human behavior--that is, college experiences and student life--has only been superficially tapped.

Objectives for studying students may be diverse from those for human behavior in general, chiefly because education is only one facet of our society and because education is viewed as a temporary phase in a person's life. But whatever the particular merits of research limited to samples of college students, most of the major objectives perhaps apply in varying degrees to most campuses. Some objectives seen as particularly significant in guiding the earlier research at the Center are the following. These were discussed for the most part by Dr. T. R. McConnell, Chairman of the Center, and members of a planning committee, long before any of the projects had gotten under way.

> How much diversity in student characteristics exists among the student bodies of various colleges and within the student body of any one college? Is the existing diversity, whatever it may be, of importance in the educational process and related to the goals achieved in the varying college environments?
>
> What are the varying background factors (socioeconomic, cultural, religious, and educational) of students in different institutions and of those within single institutions that: (1) relate to certain sets of characteristics and different degrees of academic motivation? (2) relate to or predispose to different levels of aspiration and different areas of interest? (3) relate to the fact that the majority of entering students have seemingly "learned not to learn" and only a minority are intellectually oriented?
>
> To what extent do the objectives and the over-all programs (curricular and extracurricular) of particular situations provide for or accommodate the diversity of students existing on the campuses?
>
> What degree of diversity (what level of homogeneity-heterogeneity) within any student body leads to an optimum learning environment for the "pursuit of excellence"?
>
> How may the measured diversity in student characteristics in any college be utilized in differential educational procedures--for example, selection of candidates for honors seminars and undergraduate reading courses or special considerations for the potentially creative?

> Are there important differences in the personality characteristics and in the scholastic motivation of students who major in various programs? In those continuing in graduate programs? Would such measured differences, if any, be great enough to justify varying educational procedures and objectives?
>
> What are the characteristics and what are the motivational patterns of gifted students and creative students that might more uniquely be utilized in their education?

Hypotheses relative to and derived from the above questions and the present theoretical framework of the research at the Center would probably be of interest, but space does not permit expansion on that theme. To give some meaningfulness and import to several of the above questions and to illustrate implications, data from a few projects at the Center have been utilized. This review will be cursory and of necessity somewhat superficial.

Implications from Research on Students

A brief look at diversity on the single variable of academic aptitude provides a good starting place. The premise underlying questions about diversity is that the greater percentage of institutions of higher education, if not all, should be concerned with and "understand" the heterogeneity of student ability within the single college or university, and that a smaller percentage of schools should view and educate their total student body as a group significantly higher or lower in ability than most student bodies. The data considered here are taken from a study by John Darley and others, done with the Center, on the scholastic aptitude of entering students of 1952 in a stratified, representative sample of the more than 1800 institutions in higher education. The mean ACE total score for the more than 60,000 entering freshmen in this national sample was 104.45 and the standard deviation was 27. The range of institutional means for the 200 institutions in the sample is four standard deviations (using the standard deviation of the individual score distribution). This encompasses the measured ability levels of about 97 per cent of individual students. Less than three per cent of the students score at extremes beyond actual means for total institutional groups. When considering only four-year, non-Negro colleges in this national sample, we still obtain a distribution of means 2 3/4 standard deviations long. Except for the South, the ranges of institutional means within major geographical regions encompass at least two standard deviations. It would appear that high school graduates of great variations in ability can find colleges whose student bodies approximate their specific levels.

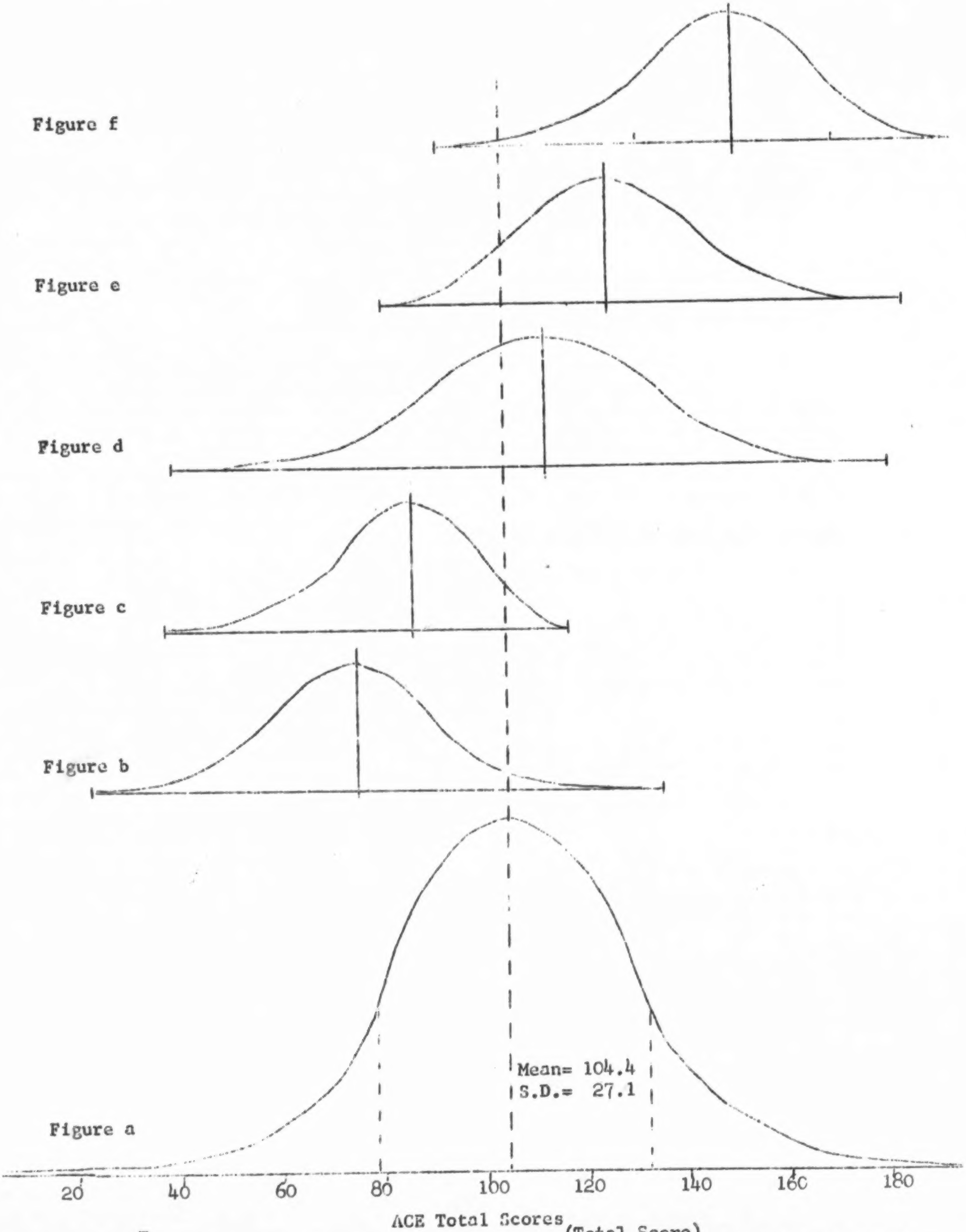

Figure ~~II~~ I. Diagrammatic Presentation of ACE Means (Total Score) and the Distribution of Scores of Entering Freshmen in the Total Sample and in Selected Institutions from a National Sample of American Colleges and Universities (Fall of 1952)

Plotted distributions for the total national sample referred to above and for five individual colleges are presented in Figure I. All five, located in the northeast and north central regions, are four-year, liberal arts institutions. These graphs do not represent unusual four-year colleges in American higher education, and any of the four major regions of the country has numerous examples of those illustrated by Figures c, d, and e. The top graph (Figure I) is a more unusual college, and the Northeast seems to have almost a monopoly of the schools with mean scores above an ACE T score of 135.

A great variety of interpretive and speculative statements can be made regarding the diversity pictured and described above. A few comments might serve to lead the reader to other considerations and implications. If restricting ourselves to the two colleges at the top, e and f, both having large proportions of high ability students, we note that the students in the bottom 50 per cent of College e are very much unlike those in the top 50 per cent of College f. Only the lower 14 per cent of the students in the latter college have aptitude scores like those of the lower 50 per cent in College e. Using College e again as a reference, one notes that about 84 per cent of the students have ability scores unlike those of 84 or more per cent in colleges represented by Figures c and b. In the latter two cases we find no students that could be described as superior in measured ability, and the definition of superior students would very likely be different in Colleges d, e, and f. College d, whose score distribution almost encompasses the ranges of the other four, is the most typical of higher education in the heterogeneity represented. In colleges such as this, many classes are composed of students whose IQ's vary over 40 to 50 points. Further discussion of these matters can be found in an article by myself entitled "Diversity in College Student Characteristics."

At the Berkeley Center, we would view five colleges such as these as having rather distinct educational environments, even when limited to these comparisons on the ability variable alone. This is based on an assumption that the students are a key factor in determining these institutional environments. Needless to say, the picture of diversity becomes much more complex when we add the differences found in other personality characteristics.

As a brief introduction to some personality characteristics viewed as important in academic environments, mean scores on selected scales* for

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*Brief scale descriptions and sources:

Thinking Introversion: Liking for reflective thought, particularly of a more abstract nature. Thinking which is not dominated by objective conditions and generally accepted ideas. (Evans-McConnell TSE Inventory)

Complexity: Sometimes called "Complexity of Outlook." Tendency to perceive and to react to the complexity of the environment, rather than to function at a level of greater simplicity. Tolerance for ambiguity and novelty. (Barron, IPAR, and Center for the Study of Higher Education)

Originality: Preference for an organized mode of functioning which emphasizes unusual responses, but which is not generally unrealistic or maladaptive. Associated with independence of judgment, freedom of expression, novelty of construction and insight. (Gough, IPAR, and Center)

Social Maturity: A personality syndrome having its origin in responses to nonauthoritarianism items and their correlates. This measure necessarily increases with increasing amounts of social maturity but is at the same time increasingly insufficient to describe it. It is correlated with age, at least in college populations. High scorers tend to be uncompulsive, impunitive, independent, unconventional, agnostic, uncynical, unromantic, and not subject to feelings of victimization; in addition, they possess genuine curiosity and an interest in intellectual and esthetic matters. (Even though the trait is so complicated, its reliability exceeds .90--Vassar-Center.)

Authoritarianism (F-scale; 28 items of Form 45/40): Anti-democratic beliefs. High scorers tend to be conventionalistic, rigid, prejudiced and emotionally and intellectually suppressed. In addition, their personal security is based upon identification with power, as represented by in-group leaders, and upon rejection of out-groups. (Adorno, *et al*. *The Authoritarian Personality*)

Social Introversion: Discriminates among those who tend to withdraw from social contacts and relationships and those seeking them and finding satisfaction therein. (Drake-MMPI)

Impulse Expression: The general readiness to express impulses, and to seek gratification in either conscious thought or in overt action: ascendance, sensation-seeking, endocathection and intraception, and radical sentiment. (Sanford-Webster-Freedman)

Responsibility: High scorers tend to be perceived as socially responsible. (Gough-Meehl-McClosky)

National Merit Scholarship (NMS) winners and for male students in several colleges in California are presented in Table 1. (The scores are in the form of standard scores; these were established on a large freshman class whose average ability was approximately at the national mean of 105.) All scales have been or are included in an omnibus inventory (OPI) assembled for research purposes.

Table 1

Standard Scores on Some OPI Scales (original instruments) for the NMS Sample and Other College Freshman Groups (Males)[1]

Scale	NMS Males	California Institution No. 1	California Institution No. 2	California Institution No. 4
Thinking Introversion	64.5	47.5	55.5	53.0
Complexity	57.0	46.0	54.5	62.0
Originality	59.0	46.5	54.5	57.0
Social Maturity	62.5	47.0	55.0	59.0
Authoritarianism	45.0	56.0	50.5	46.0
Social Introversion	51.5	57.5	54.5	54.0

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[1] The standard scores are computed with a mean of 50 and a standard deviation of 10 using a sample of college freshmen whose mean ability score is at the national mean for entering students.

In Table 1, Institutions No. 1 and No. 4 both have mean ability scores very close to the national freshman mean, but rather large nonintellective differences appear on the following scales: Thinking Introversion, Complexity, Originality and Authoritarianism. On the last three scales the differences are of a magnitude of one standard deviation or greater. The scores of Institution No. 4, except for the first scale, are most like those of the National Merit Scholarship winners, the latter group being very different on the ability variable. Research results have shown that scores on these scales are closely related to a student's motivation or orientation toward intellectual pursuits and to his activity within an academic environment. However, such a motivational pattern, especially as indicated by the latter three scales, does not necessarily correlate with grade-getting. In contrast to Nos. 1 and 4, the mean aptitude score for Institution No. 2 is approximately three-fourths of a standard deviation above the national mean.

The typical male student in Institution No. 4, whose Thinking Introversion score is near the average of the reference group, is most likely not scholarly in an academic sense but, judging by the other scores, could be characterized as complex in his orientation, as independent, free-thinking, somewhat rebellious and perhaps not a good candidate for colleges with "restricted" student life. Students in Institution No. 1, on the other hand, might be seen as fairly typical of a great many students in our "halls of learning," not motivated academically and not really interested in the acquisition of knowledge. On the basis of additional measurements known to the author, their orientation or quest in college could be curtly described as "applied." We would suggest and contend that these apparent differences in two student bodies are indicative of two different student peer cultures, two different psychological climates (neither of them perhaps conducive scholastic climates), and that existence in such different academic and social contexts would produce different effects on the continuing motivation of individuals. Dr. McConnell and myself have discussed these matters further in an article entitled "Do Students Make the College?" From such obtained differences it seems advisable that research in many colleges should include some analysis of the personality patterns and the psychological climate of student bodies per se.

The significance of differences among institutions on these personality traits which are viewed as measuring an intellectual disposition is also demonstrated by the scores for two liberal arts colleges found in Table 2. The table appears in Heist and Webster's article on "Differential Characteristics of Student Bodies with Implications for Selection and Study of Undergraduates." The mean aptitude levels of the male student bodies in these two schools are approximately the same, over one standard deviation above the national college average. Though the scores on the first four characteristics are high for both schools, the consistency of the differences on the five scales, that is, the pattern of higher scores in College No. 1 over those of No. 2, causes speculation regarding a more provocative climate in the first college. However, the speculations have some external confirmation; observations of student life and a variety of other data indicate the general intellectual intensity of activity on both campuses, but the fervor on one is definitely shared by more individuals. Incidentally, the freshmen in a college like No. 1 score higher on most of these measures at time of entrance than the seniors in many another college.

Table 2

Mean Standard Scores on Selected Personality Scales for Male Freshman Students in Two Liberal Arts Colleges[1]

Scale	Means College No. 1	College No. 2
Thinking Introversion*	63.1	58.1
Complexity*	66.1	60.1
Originality*	64.5	58.1
Social Maturity**	68.8	61.8
Social Introversion**	52.0	48.2

*Significant at the .01 level

**Significant at the .05 level

[1] The standard scores have been computed using a sample of freshman men whose mean ability score is at the national mean for entering students.

When institutions such as these presented in Table 2 and No. 4 in Table 1 are apparently selective of many students with certain distinct attitudes and interests, there is even greater reason for wondering about the prominent subgroups on these campuses. Whether or not subgroups or subcultures are at all identical from college to college, a research concern for the categorization of any total student group might do much more than lead to the identification of the gifted, the potential scholars, and the potentially creative. Determination of the subcultures on any campus, however they may be categorized, and studies of the development and changes in students in these different groups, could possibly permit us to isolate some of the reasons facilitating or hindering effective education and effective change in attitudes and values. It has been suggested and discussed by Benno Fricke, in "Prediction, Selection, Mortality and Quality Control," that research on students should lead to better matching of type of institution and "type" of student. Others have gone so far as to ask whether it would not be advisable to quicken the "main stream" of some student bodies by placing small groups of highly or differently motivated persons there to serve as catalysts. Any such attempts demand much greater understanding of existing student groups and a greater concern on the part of admissions and personnel staff.

Paul A. Heist

Whatever most schools do to accommodate the greater numbers of the ensuing decades, all institutions will need to pay more attention to specific students and "types" of students. Many colleges may desire to be more selective or be forced to such a policy; other institutions working with thousands and tens of thousands will need to become more discerning about the heterogeneity of their student constituency. A number of colleges, already very selective relative to the ability and achievement of students, are attempting to backtrack a little and are seeking other variables to assist in the decisions made by admissions committees. At the Berkeley Center we have begun to examine whether some motivation or personality measures have sufficient potency and relevance to be used either as selection or classification criteria. Our initial work might be illustrated in various ways and with a number of scale combinations; some data resulting from classification of students through a particular composite of three scales will be utilized here.

Quoting from the Heist and Webster article on "Differential Characteristics of Student Bodies with Implications for Selection and Study of Undergraduates" in which this material is discussed, "We selected samples of high ability students who were either high or low on the following three scales: Thinking Introversion, Complexity, and Originality. To some degree any of these measures would identify students who had intrinsic interests in knowledge and in intellectual activity for its own sake. We wanted to study the differences between groups of students whose scores were at least half a standard deviation above or below the mean on all three of the scales.* The mean standard scores in Table 3 are on samples of National Merit Scholarship winners (males only) who were classified in this fashion into two groups. The High Group might be viewed as genuinely interested in learning (by definition of the criterion scales) and the Low Group as much less so interested, if at all, though this is seemingly paradoxical in view of their high ability and their high school achievement record. It would perhaps be more accurate, or fairer, to describe the Low Group as interested in a different kind of learning. On measures of socioeconomic background and mathematical aptitude these two groups appeared to be identical. Scores for both on scales from the Minnesota Multiphasic Personality Inventory made one group appear as "normal" as the other.

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*Miss Phoebe Williams, from the Center staff, is to be credited with much of the analysis of these data.

Table 3

Mean Standard Scores on Selected Personality Variables for Groups High and Low on Three Scales (TI-Co-O) Measuring Intellectual Interests (N's = 40 Males Each)[1]

Instruments and Scales	High Group Mean	Low Group Mean	Difference
OPI			
Social Maturity	56.4	41.0	15.4*
Authoritarianism	35.2	56.0	-20.8*
Social Introversion	42.3	50.1	-7.9**
Impulse Expression	46.3	38.2	8.1*
Responsibility	62.2	56.3	5.9*
Study of Values			
Theoretical	64.1	57.6	6.5*
Economic	38.2	53.5	-15.3*
Aesthetic	59.4	41.3	18.1*
Social	43.6	43.4	0.2
Political	49.5	50.5	-0.9
Religious	46.7	53.0	-6.3*

*Significant at the .01 level

**Significant at the .05 level

[1] The standard scores are computed with a mean of 50 and a standard deviation of 10 using a large population of college freshmen as the base distribution for the Study of Values; for the OPI scores a random sample of University of California male freshmen serve as the base group.

Looking at the actual scores on other scales found in the OPI and Gordon Allport's *Study of Values* (Table 3), the numerous significant differences readily demonstrate how much the two groups vary. Summarizing on the basis of the major differences, they add up to having in the High Group students with greater maturity and general sophistication, greater freedom and flexibility in thinking, greater sensitivity to artistic aspects, a willingness to relinquish traditional or fixed values, and a greater readiness to examine the new and the different. One major investigation at the Center has revealed many students with scores like those in the High Group attending colleges ranking high in the productivity of scholarship (ranks determined by the Knapp and Greenbaum criteria as discussed in their *The Younger American Scholar*).

The figures in Table 4 readily indicate that the academic majors for the two groups are also considerably diverse. Only about 12 per cent of the High Group initially entered Engineering, with the largest concentrations in the theoretical sciences and in subject areas which might appropriately be described as the life sciences and the humanities.

These data are similar to the kind of information that student personnel people have been aware of for a long time and often utilize in their counseling capacities. One might pertinently ask if they are possibly of additional value. For example, supposing a college staff becomes aware of the dominant characteristics and motivational patterns of its students, how many persons of either the Low or High Group can they readily absorb? As implied above, too many of the latter group would probably be hard to come by, but would too many of the Low Group, at any level of ability, add a stultifying component to a small campus? A number of colleges can presently be identified where Low Group students would be rather sadly misplaced; such institutions might use the three scores from the classifying scales as a final criterion for rejection. Looking at this from a reverse direction, in those cases where a person's high potential and unique motivation are recognized, how many institutions would refuse admission and recommend a more appropriate educational environment for this person? More generally, and looking at the two groups from the standpoint of typical American colleges, (1) what attempts are presently made to identify those with either degree of intellectual motivation? (2) What provisions exist in the curriculum and in the teaching staff for educating students of such widely diverse motivational sets? The speculative aspects of the above conjectures and questions are very apparent but suggestive of some of the great variety of research on students which remains to be done.

Student Characteristics and the College of Tomorrow

In the "new tomorrow" of American higher education, *some considerations* of the total program will continue to be: the greater number of students, increased scholarship programs and the granting of scholarships, expanding institutional research, and more diligent assessment and evaluation of students. The last might easily develop and increase

Table 4

Choice of Academic Major for Members of Groups High and Low on Three Scales (TI-Co-O) Measuring Intellectual Interest (N's = 40 males each)

Major Field	High Group N	High Group Percentage	Low Group N	Low Group Percentage
Engineering	5	12.5	25	62.5
Mathematics	7	17.5	0	0.0
Physics	6	15.0	3	7.5
Biology	2	5.0	0	0.0
Psychology	3	7.5	0	0.0
Sociology	1	2.5	0	0.0
Economics	0	0.0	6	15.0
History	6	15.0	0	0.0
English	3	7.5	0	0.0
Music	3	7.5	0	0.0
Industrial Design	1	2.5	0	0.0
Radio-TV	0	0.0	1	2.5
Business	0	0.0	1	2.5
No Choice	3	7.5	4	10.0

to the point of inciting student rebellion, but, beyond any doubt, more and more colleges and universities will take more frequent and more diligent looks at their students.

As institutional staffs become aware of the differences among students and student groups, and cognizant that a larger number of criterion and predictor factors can be measured, much more time and effort will go to studying and attempting to understand the students and the most conducive learning environments. To date, only minimal attempts have been made "to know" and to accommodate the great diversity in students. Differences in institutional structure will probably not change greatly with the large influx of students; certainly the same is true of differences in student characteristics. There continues to be a clear need to study what kinds of situations and environments do what for different types of people.

Fundamental changes in values and attitudes are probably not possible for all students, but even for the potential changers it would seem advisable to look at the circumstances and conditions of change. In general, far too little is known about the development and education of all students, beyond the acquiring of knowledge and skills. What students change? How do they change? What are the factors related to change? These and other questions need the attention of many more research persons in a variety of environments.

In many small colleges, a "proper" selection of students will probably be as effective a step to an improved climate for learning and scholarship as the attention given to selection of faculty. A major variable underlying the impact of certain institutions and any change in students is the students who select and who enroll in the institutions. The total college milieu may be changed or improved most quickly by changing (through recruiting, selecting, admitting) the student composition. For a majority of institutions this may seem virtually impossible. Therefore, special attention to differential treatment of students within institutions merits particular consideration.

Students in any institution should be seen and understood within context of the other students or the predominant peer culture. Their level of motivation, their interests, and their potential for growth are in large part determined by reactions and recognition from their immediate peers.

Measuring, analyzing, and understanding the motivation and personality of students are still in the frontier stages, but it is possible to measure a pattern of variables related (1) to intrinsic interest in learning and to motivation toward scholarly achievements, (2) to the choice of type of institution attended, and (3) to the particular subgroup affiliation within total student bodies. Research to determine the correlates of these three should add considerably to the understanding and education of students on any campus.

Paul A. Heist

V. Institutional Studies of Student Characteristics

. . . . J. Kenneth Little

I am going to describe a program of research on students in which I have worked at the University of Wisconsin. I shall describe the general objectives of this program, an outline of the types of basic information which we regularly collect there, and brief comments on some special studies which we have undertaken recently.

General Objectives

The program of studying students has as its objective the collection of such information about the student body, past and present or future, as is needed to: (1) guide administrative and institutional planning; (2) interpret the institution to its public; (3) prepare institutional reports as requested by government agencies and/or educational associations to which the institution belongs; and (4) contribute new information or fresh insights and understandings about the characteristics of students or groups of students, and their achievement and progress in the institution.

Basic Information

In developing basic information on students, several steps are followed: (1) a decision is made regarding the types of information for which there is recurring or frequent use; that is, we try to anticipate the need for data on students--from the time they are applicants through the period in which they become alumni--that will be needed for carrying out a variety of institutional programs. (2) Coordination is sought in the development of forms and procedures to be used in gathering data about students. It is crucial that this step be taken, in order that the special needs of administrators in the offices of admissions, registration, student records, counseling, placement, fee assessment, alumni records, and institutional reports can be met. They must be able to use with accuracy all the data that is collected. (3) A comprehensive standard enrollment report is developed for administrative use. The report is composed of those tables of basic information about students for which there is recurring or frequent use. (4) Interpretive summaries of the above information, showing facts or trends which have significance for institutional planning or are useful in institutional publicity are prepared. And (5) visual materials are developed which describe facts and trends in simple and pictorial fashion. These are especially valuable for use in presenting data to audiences not generally familiar with the institutional programs.

Several types of information are included as "basic student enrollment information" at the University of Wisconsin. Let me review three major types of basic information and, under each heading, list the specific items of data which we collect:

(1) New and advanced standing students. For these students the following information is procured: a) origin--high school or college attended, home address, (city, county, state, nation); b) occupation of parents--(also, whether alumni of university); c) sex and marital status--single, married (number of children); d) quality--(rank in class; test scores; scholarship assistance); e) self-help--(extent of part-time work); f) course of study elected; and g) veteran status.

(2) Continuing Students. For those students enrolled over a period of time at the university, the following information is continually recorded: a) college residence; b) academic classification (college, degree, major); c) courses in which enrolled; d) grades earned in courses--(g.p.a. and cumulative g.p.a.); e) scholarship and honors; f) action--(academic and conduct); and g) transcripts.

(3) For alumni, the following information is sought: a) address b) occupation--(type and position) and c) special achievements.

Large schools usually accomplish the analysis and tabulation of this information through the use of business machines. Small schools do not require this type of assistance, usually. Analysis as detailed as this is likely to be burdensome to schools whose enrollment are too small to justify machine procedures, but are too large for manual counting and tabulation. Such schools usually settle for less elaborate information and analysis.

The type of enrollment report used will vary from one institution to another. The point is to collect and organize data in such a form that it can serve as a handy reference and at the same time serve to facilitate quick studies of changes or trends in student enrollments and in other features of student characteristics. Much of the information should be in such a form that it can be readily cast into other tables and used easily for investigations in depth.

Special Studies

Let me now describe some of the information developed from special studies of student characteristics. I will try to give you a skeleton outline of the studies and some indication of the major findings of each.

(1) Trends in the quality of students, 1930-1955. A comparison was made of entering freshmen students in 1930, 1935, 1940, 1945, 1950, and 1955 on such measures as: (a) rank in high school graduating class; (b) percentile rank on the American Council Psychological Examination; (c) grade point average in freshman year. Result: today's students show superiority on each measure.

(2) Achievement and persistence of academically talented students in a state university. A follow-up study was made of high ranking high school graduates who entered the university. A comparison was made between those who persisted through two years with those who did not. Patterns of difficulty in areas of greatest and least academic mortality were studied, as were reasons for discontinuance. Result: the study showed the unfortunate amount of attrition among such students; academic maladjustment seemed to equal financial difficulty as a causative factor.

(3) A comparison of members of the 1953 freshmen class who graduated four years later with (a) those who were dropped for scholastic deficiency; (b) those who withdrew voluntarily; and (c) those who transferred to other institutions. This study is still in progress. Findings so far indicate that students ranking in the top one-fourth of the class in both high school ranking and mental test scores furnished the majority of those who graduated four years later. One-half of all entering students and one-third of the graduates had experienced scholastic difficulty in one or more of their semester's work. The loss of high ability freshmen before graduation approximates less from this group between high school graduation and college entrance. Students in courses with specific occupational objectives had higher persistence ratios than did those in general purpose courses.

(4) A test of the effect of suggested admissions standards. 1957 graduates were used as the test group. Several proposed admissions standards (rank in high school class, rank among all high school graduates on a mental test, rank among entering university freshmen on a psychological examination, and other entrance tests) were applied to learn to what extent the use of such standards would have denied admission to those who became graduates. Result: none of the standards, whether used singly or in combination, provided a screen which would not have excluded a sizeable number of the graduates. Some of those who would have been excluded were honor students.

(5) A study of the 1957 graduates. This study focused upon (a) the proportion of the graduates who continued on to graduate or professional schools, by field, (b) the types of occupations entered and the starting salaries, and (c) the migration of the students to graduate schools or jobs. Result: from 20 to 25 per cent of the men were moving immediately to advanced studies; seven to ten per cent of the women were doing so. About one-third of these had been awarded fellowships or assistantships. The liberal arts college furnished the largest number of graduate students. The graduates accepted positions in all parts of the nation and many parts of the world.

(6) A study of differences in marking practices between departments and within departments. The following data were collected: 1) distribution of marks among students with various average achievements; 2) comparisons of marks earned by students in a given course with those earned by the students in all other courses, and 3) patterns of course

difficulty as experienced by students who became academic casualties. Regarding the latter, three specific topics were studied: (a) relative importance of verbal skills, (b) sex differences, and (c) the importance of occupational or other specific goals. This study is still in progress.

(7) Factors influencing decisions of youth about education beyond the high school. A state-wide study was undertaken of 1957 Wisconsin high school graduates and their plans for education beyond the high school. Topics studied included student's abilities, family backgrounds, school and community differences, and academic preparation. Results: the study eliminated the important motivational differences between boys and girls. Further, the strong influence of educational attainment of parents became evident. This study compared students going to public colleges with those going to private colleges.

(8) A study of scholarships held by college students--1958. Students in all Wisconsin colleges and universities reported during registration in the Fall term of 1958 whether they held scholarships; the source and value of the scholarships; whether they needed the scholarship to attend college; whether they borrowed money and from what source; and whether they would be required to work part time while attending college; and if so, how much time. Result: about 16 per cent of all students interviewed reported that they held scholarships. About one-third of the scholarships were from non-university sources. Ten per cent of the scholarship holders said they would not be in school without the scholarship, forty-seven per cent said attendance would have been doubtful, and fifty-three per cent said they would have attended without the scholarship. About 20 per cent of all students involved had borrowed money, including the many who said they also had scholarships. About 25 per cent reported that they must work part time while attending college.

The studies reported above are samples of studies completed or underway at the University of Wisconsin. Many other types of studies are contemplated, and will be carried out within the next several years.

VI. Projecting Student Enrollments

. . . . **John K. Folger**

This will be a discussion of enrollment projections for individual colleges and universities. The related problems of national, regional, and state projections of enrollment will not be considered specifically, and we will assume that a state level projection is available to assist with the institutional projection.

The techniques for making enrollment projections are not in any sense a substitute for judgment and knowledge of your institution. They can be an important aid to judgment, and can insure that you look beyond the surface at some of the underlying factors involved. Elaborate statistical manipulations may give the impression of accuracy, but they will be no more accurate than the assumptions on which they are based. The assumptions depend essentially on your judgment, and if your judgment is bad, your projections will be bad.

Now in a technical sense, a projection cannot be "bad" or "good," since it is merely a statement of what will happen under certain conditions. But everyone persists in regarding them as predictions; why would you make them if you weren't interested in the future? So, although you should be careful to point out the assumptions on which your projections are based, do not expect that this will protect you if they go astray. If they are accurate, people will regard them as good; if they are inaccurate, people will regard them as bad.

A recent experience may illustrate the function of judgment in enrollment projections. Several years ago, the Southern Regional Education Board prepared a series of projections of public school enrollments for each of the Southern states. We got the advice of expert consultants and prepared a careful set of statistical projections, using the best procedures we could, and uniform assumptions for all states.

Several of the states had already made projections of their own, so it was possible to compare their work and our work with the actual enrollment as it entered school in the next few years. In North Carolina, the projections made by the person in the state were always more accurate than ours were--and usually missed the actual enrollment by less than ½ of 1 per cent. We checked with the statistician in North Carolina to find out what method he used, and he said he didn't use any "method" at all. He just took the data for the preceding year and studied it, and using his knowledge of the events in the state, worked out projections for the next year or two.

This experience illustrated for me the value of knowledge of your data and what it represents. It suggests that the best role for a statistician who doesn't work continuously with the data may be as consultant and adviser to the person who is actually best informed about the data.

The projection of enrollment for a single college is usually a more difficult job than for a whole state or region because more variables are involved. To make a good projection for a single institution you may need a projection of the enrollement trend in the state, in the region, and even in the nation. But the extent to which these are important depends partly on the kind of institution you have.

Some institutions are highly localized, drawing nearly all their students from the immediate area, sometimes from a commuting area. Others are state and national in scope. If an institution draws students nationally, this usually means that population data and public school enrollment trends in the state or nation will not be helpful to you because national institutions usually select from a fairly limited spectrum of the total students in the country.

Types of Enrollment Projections

There are two principal uses for enrollment projections, and depending on your purpose, you may employ somewhat different procedures. The first use is for budget preparation, and for this purpose a two to four year projection is sometimes all that is required. (Except for capital budgets, where longer range projections may be desirable.) The second use is for long range planning purposes--and here 10 to 20 year projections are usually desired. The uses made of shorter range projections require greater accuracy, but they are often made with less concern for elaborate statistical procedures (as illustrated by our North Carolina friend). Long range projections require you to define a trend line or trend lines to use as the basis of your projections; this will usually lead to more elaborate procedures, but not necessarily to greater accuracy.

If you plot college enrollment for the past 30 years in any state on a graph, and compare it with a graph of public school enrollment, you will observe that the college enrollment fluctuates a great deal more. There are more irregularities in the data. Since enrollment in college is much more a matter of individual choice than public school enrollment, the greater variability of the data is easily understandable. You have to accept this and be prepared for wider margins of error in your projections of college enrollment. Before considering the sources of fluctuation in enrollment in detail, a few words need to be said about the dull but important problems of defining enrollment. It's an important topic because we have so many definitions of a student, and they mean such different things.

Problems of definition of enrollment have bothered individual institutions, but are even more bothersome to people who are trying to put data together for a group of institutions in a state-wide, regional, or national projection. The definition of enrollment that the Census Bureau uses, for example, is not comparable with that of the Office of Education. This does not mean that either one is intrinsically better than the other; it's just that they are different concepts.

Census data is collected by enumerators visiting either a sample of homes, or every home every ten years, and mostly the information is collected from the family. If you look in the census volumes at your age-grade tables, and the census has age-grade tables for each state, you will find an upward bias in the census data. It reports people at a higher grade level than the enrollment statistics that you get from the school systems. There seems to be a natural tendency for people to overstate the grade in which a person is enrolled; part of this is perhaps due to misunderstanding, but it is also because census information usually is not collected from the individual but from the head of the household. You will find more people reported as seniors in high school by the census than you will from the state department of education in your own state and fewer people in other grades. Overall, the census figures are usually about three to ten per cent less than the enrollment figures in the state.

Enrollment figures from Office of Education reports are based on several concepts. The Office of Education describes these, and you need to be careful in using Office of Education data to know which type of enrollment is reported. "Total enrollment," which includes all the students who were enrolled during the entire year, isn't comparable with "fall enrollment" (a smaller amount) which refers to the number of students in the third week of the fall term.

The kind of figure that you want to project depends on your purposes. If you are interested in operational costs of the instructional program, you may be a good deal more interested in a "student credit hour equivalent" projection than in a "head count" projection of the total number of people, both full and part-time, that will be enrolled. There is a good discussion of different concepts of enrollment in the booklet by Calvin Schmid of the Washington State Census Board, Enrollment Forecasts in the State of Washington, 1957-1965. Chapter 8 of this booklet discusses definitional problems and provides illustrative statistics.

Schmid discusses regular resident enrollment, the full-time student equivalent based on credit hours, and non-credit enrollment, and he develops projections for the state of Washington for all three of these concepts. It is interesting to note that some types of enrollment are almost completely absent in some of the Washington colleges; that is, some had no part-time students, while others may have many more part-time or non-credit students than they have full-time or credit students.

Factors Affecting Enrollment Forecasts

Let me return to the variables which affect enrollment projections for any college. To the extent that we can identify and measure each source of variation, our projections should be improved.

The first, and one of the most important factors affecting enrollment, is the size of the college age population. We know a good deal about the way that the college age group is changing, and if we limit our projections to an 18 year period we are dealing with people who are already born. Our college age population projections are very accurate for the nation as a whole, somewhat less accurate (but still pretty accurate) for individual states, and are not very accurate for small areas such as counties. Migration is the factor that decreases the accuracy of projections for smaller areas.

A very useful set of projections of the college age population has been prepared by the Census Bureau in their P-25 series, Number 132. This leaflet gives projections of the total 18 to 24 year old population at five-year intervals between 1958 and 1973 for each state. Three different migration assumptions are provided. In some rapidly growing states like Florida, Nevada, and California you will find that if you take the assumption of no migration and the assumption of a continuation of the rate and amount of migration that occurred between 1940 and 1950 and use these in a projection to 1973, the migration assumption figures will be nearly twice as large as those assuming no migration.

The Southern Regional Education Board took these Census data and broke them down into greater detail--into single years of age--and prepared projections for each year from 1958 to 1973. If you have a junior college and are primarily interested in the 18 to 19 year old group you will want projections of those ages. If you have a liberal arts college which has a predominantly young student body you may be most interested in the 18-21 year old group. And if you have a university you would probably want to use 18-24 year old group as a base for projections. This same kind of breakdown can be done for any of the states. It is a job which you could do yourself, or if you have an economist or demographer on your faculty, he could probably make the appropriate breakdown for you.

Getting good projections of the college age population for areas smaller than a whole state are difficult. I would advise you, if you need to prepare college age population projections for a small area of the state, that you get the advice of a demographer or economist who is accustomed to working with this kind of information.

Another factor which has been more important than the college age population in the last five or six years of growth in college enrollment has been the growth in the number of high school graduates and the changes in the proportion of youth who want to go on to college. In the period between 1952 and the present there has been very little increase in the total size of the college age population in the country as a whole. In fact, the college age population is just now beginning to rise rapidly. The birth rate really didn't go up sharply until World War II began and its major climb was in 1947 and subsequently. The impact of the increased birthrate on the colleges is still largely in the future. In the 1952-57 period, however, when the college age population grew hardly at all, college enrollment rose over forty per cent in the nation. Most of this is attributable to an increased desire of people to attend college.

In most states very good data can be obtained on the number of high school graduates, and this can usually be obtained for each school system in the state. If your institution draws most of its students from a small part of the state, you can get information about the number of high school graduates in the service area of your institutions; something you can't do easily with the college age population. In some instances, you can obtain projections of future high school graduations for the state or for school systems.

After you have information on the college age population and the number of high school graduates, you come to the really interesting variables that will affect your projections. They are also the most complicated, and the ones we know the least about.

Who wants to go to college? Among those who don't want to go, what might change their minds? Who among those who start out to college will never get there? What effects would a major shift in the economy have on college entrance? What will be the effect of opening a new college nearby? Of higher tuition in other institutions?

To answer these questions we need a number of studies about who goes to what college. How are choices made among colleges? What proportion of your students are drawn from upper income groups. From lower income groups? Studies such as those reported earlier by Ken Little and Paul Heist should be very helpful in giving us a better picture of who our students are and why they make the choices they do.

Any institution attracts a certain segment of all college students in competition with other colleges and universities. The curriculum, the amount of tuition and other costs, the prestige of the school--all these affect its drawing power. An institution cannot study its drawing power by itself, because it needs to know about the students who chose other colleges, as well as those that chose it. There have been very few studies of these questions. Dr. Cowan of New York State, for example, studied various socio-economic factors in relation to college attendance and also the relation of distance to college attendance.

The size of the college age group, the number of high school graduates, the socio-economic status of potential students, their educational aspirations, all of these and more are variables affecting enrollment projections.

Three Approaches to Enrollment Projection

There are three interrelated approaches to enrollment projection.

The first of these techniques is "cohort analysis," in which a grade (or age) group is "survived" through the college years. By adding up all the cohorts that are supposed to be in college in a given year the total enrollment can be estimated. For example, one could count the number of pupils in the ninth grade in a state and, allowing for drop outs, death, etc., "survive" some portion of this cohort group through the 12th, 14th, and 16th grades.

The second technique is the "ratio to population" analysis. Here you begin with a projection of the college age population, and by estimating the future proportion of the age group that will be in college, you can make a projection of college enrollment.

The third technique is an elaboration of the first two called "component analysis." It is based on the notion that sub-groups of the population have different patterns of college attendance. For example, girls attend college in smaller numbers than boys. If we separate our data by sex, and make a projection (by *either* cohort or ratio procedures) for each sex group and then add the two together at the end we have a total projection made by component analysis. It is obviously more work, but should produce more accurate results if you have chosen your components properly.

Cohort analysis should prove more accurate than a ratio projection for a projection of only two or three years. For longer periods, the evidence is not so clear: either may turn out to be superior. Step by step computational procedures for cohort analysis can be found in the booklet by Schmid (referred to above) and also the book by Freedman on *Future School and College Enrollments in Michigan*. One drawback of cohort analysis is that if an error is made in introducing a cohort into the projections, this error will stay in the projection as long as this cohort is in college. If you introduce too small a group of freshmen into college in 1962, for example, this group will be "survived" through to graduation in 1966, and will affect the projections for all the years between 1962 and 1966. The "survival" rates will not have any effect on this type of error.

The great advantage of the ratio method is its ease and simplicity of computation. If you already have a college age population projection for the state or a part of the state, then the computations for a ratio projection are quite simple. Its simplicity is also one of its drawbacks.

Usually only a single ratio of population and enrollment is projected, and it combines all of the assumptions about the variables described above into one figure--thus eliminating the possibility that you can identify the separate sources of variability in the projections. A good discussion of trend analysis as it can be applied to both ratio and cohort projections is found in Boling and Gardiner's Forecasting University Enrollment. Many texts on economic statistics (Croxton and Cowden, for example) also contain information on trend analysis.

If you use a component approach, and compute a separate ratio for each component (for example--men, women, high scoio-economic status, low socio-economic status, etc.) this eliminates some of the drawbacks of combining all of the variables into one ratio. The component approach can also be used with a cohort analysis of each separate component, rather than a ratio approach.

An Enrollment Projection for "Western College"

In order to make the foregoing rather abstract discussion more concrete, the steps taken in making a projection of the enrollment for a state college will be outlined.

Background. "Western College" is a state-supported institution which offers degrees in liberal arts and teacher education. The liberal arts degrees are new; until two years ago the institution gave degrees only in education. It enrolls about twice as many women as men, primarily because of its curriculum emphasis. Most of the students come from an area of about 10 counties immediately around the college. There is no other state-supported college within 50 miles, although a branch of the state university has been proposed for a nearby small city. There are two private, girls colleges within fifty miles and one private, coeducational junior college.

Step One. A projection of college enrollment for the state was obtained from the state university. A projection of public school enrollment, including high school graduates, was obtained from the State Department of Education, and the census projection of college age population was obtained. Current estimates of the population of counties in the state were obtained from the Bureau of Business Research at the state university. (In most states data comparable to this will be available from various sources.)

Step Two. The primary service area of the college was defined to include the counties supplying two-thirds of the student enrollment. Actually, two-thirds of the enrollment came from eight counties, but two others were included because they supplied almost as many students as several of the eight that were included.

Step Three. Past population and enrollment trends in the state (over the preceding thirty years) and in the primary service area were studied. The state was growing slowly as a result of a relatively high birthrate and moderate out-migration. The primary service area was, however, growing more rapidly than the state as a whole. It contains several small cities (10,000-25,000) and is being industrialized fairly rapidly.

Step Four. Components were selected for projection. Since the new liberal arts curriculum was thought to be more attractive to boys, it was decided to make separate projections by sex. It was also decided to assume that most of the students would continue to come from the immediate ten county area, since analysis of the past twenty years indicated that the institution had drawn most of its students from this area during the entire period, and also had not increased its proportion of all college enrollment in the state. (Between four and five per cent of all college students in the state have enrolled in "Western.") A separate projection was also made for urban and rural high schools in the primary service area, since past data revealed that "Western" enrolled a large proportion of those rural high school graduates who went anywhere to college, but a smaller per cent of the urban high school graduates. The change in curriculum was thought to make "Western" more attractive as a college to urban high school graduates. (For purposes of this analysis, all high schools in cities of over 10,000 were defined as urban.)

Step Five. A cohort projection of high school graduates in the primary service area was prepared separately by urban and rural high schools and by sex.

Step Six. Projections of the proportions of each of the four subgroups above who would enter "Western" were developed using past trends plus guesses about the effects of the new curriculum on attendance rates.

Step Seven. To these projections were added a constant proportion to allow for students from outside the service area. The total entering group was then "survived" through four years of college to graduation ("Western" offers no graduate work).

Step Eight. The projection was then compared with the projection of college enrollment for the state as a whole and the growth of college age population in the state (data obtained in Step One). Because the projection for "Western" resulted in a rapid rise in the proportion of all college students in the state who went to "Western," it was adjusted downward to provide a more moderate increase.

Step Nine. Alternative projections were prepared, one with conservative assumptions about the per cent of high school youth who would come to "Western," the other with optimistic assumptions. These two alternative projections provide a range of enrollment possibilities which should be helpful in planning.

In summary, these are some of the general considerations and an example of procedures for making an enrollment projection which may be instructive. If you have not prepared a projection before, prepare some projections yourself, and then get some knowledgeable people to criticize them. (Or perhaps you would rather get advice both before you begin and after you finish.) And finally, good luck. You will need some if you are to get good results with your forecasts.

John K. Folger

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VII. Research on the Faculty

. . . . John E. Stecklein

I will discuss studies of the faculty and educational research carried on by the faculty in the context of a "case study" of the role of the Bureau of Institutional Research in a large, state-supported university.[1] This may give some insight into the process of formulating a research study by the Bureau, the role of the Bureau in the development and conduct of the research, the purposes of the studies, and the techniques used. In a few instances, I will discuss the utilization of the data obtained from the research study and will present some of the findings wherever they seem most interesting and as time permits.

Although this approach to the topic may appear to be somewhat provincial, I felt that you would gain more from a discussion of specific research studies conducted in a specific institution, than you would if I attempt to discuss broad aspects of studies of the faculty or to give you a kaleidoscopic overview of studies conducted by institutions throughout the country.

Faculty Characteristics

I am sure you have all heard expressions such as "the faculty is the heart of the university," or "the quality of a college is determined by the quality of the faculty." If, as stated, faculty members are the heart of a university, it should follow that how well an institution serves its function of teaching, research, and service is mirrored in the utilization of its faculty resources. As Dean Russell M. Cooper, a former chairman of the Senate Committee on Institutional Research at Minnesota once said, "...self knowledge is as fundamental to a University as it is to a person."

But for an institution to appraise its quality using the indirect measure of faculty quality, it is necessary that the characteristics of the faculty be known and that these be skillfully analyzed to determine general excellence. In addition to studies of quality characteristics of faculty, any alert institution which has reached the size where the president can no longer know his staff intimately, needs to have available periodically a descriptive overview of the nature of the faculty. Aside from its descriptive and informative value, such a periodic analysis can provide valuable data for the control of quality of faculty in terms of long range hiring and expansion programs. The people responsible for hiring new faculty need to know about such factors as inbreeding, age distribution, rank distribution, and types of research interests or publications of their current faculty.

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[1] This chapter and the following chapter were originally given as one lecture.

Let me illustrate some of the kinds of information that can be made available by a careful analysis of the characteristics of a university faculty, by referring to a 1953 study of faculty characteristics at the University of Minnesota. This study, as well as the two previous ones made in 1931 and 1943, was motivated by faculty interest and conducted by a faculty group rather than emanating from the desire of a university administrator to collect such data. The value of a series of such studies can be sensed immediately, I believe, because, although it is valuable to have a picture of an institution's faculty at any given point of time, it is even more important to compare characteristics, trends, relationships, and welfare of a faculty group over a stretch of years.

Time permits only a few comments about the 1953 study. As with the 1931 study, this analysis evolved from a concern about inbreeding. One member of the Senate Committee on Institutional Research was convinced that inbreeding was bad, that the University of Minnesota staff was deeply inbred, and that the quality of the staff was therefore suffering. After considerable discussion and several meetings of a special advisory subcommittee, a study of inbreeding was set up which would incorporate a third, ten-year follow-up of the earlier faculty characteristics studies. The hypotheses to be tested were that there were no statistically significant differences between locally trained individuals and those individuals who were trained elsewhere, in terms of such things as average salaries, length of appointment prior to promotion, number of "dry" promotions, number of years at a particular rank, average annual salary increases, publication productivity, time and length of teaching experience, memberships in professional and learned societies, and off-campus professional obligations and awards. Data were also collected to determine which departments and colleges had the highest amounts of inbreeding.

As those of you who may have studied the problem of inbreeding know, some interesting problems of definition are immediately encountered when one tries to define a person as being inbred. For example, is a person inbred if he has received one degree, two degrees, or three degrees, from his employing institution? Is he inbred if he has received only his highest degree at the institution? Or should the definition be restricted so that he is considered inbred only if he receives his Ph.D. from the institution?

To see whether the definition would affect the results, special tabulations and comparisons were made using three possible definitions--Ph.D.'s earned, highest degree earned, and any degree earned at

Minnesota. Since no appreciable differences were noted in the comparative distributions made on these three bases, only one--one or more degrees from Minnesota--was used in the comparative analyses included in the final report.

Selected Tables from the 1950-51 Study

Approximately 70 pages of tables of faculty characteristics data emerged from the study as a whole. The tables in your notebooks were selected as representative of the data obtained in the study.

Inbreeding: --The distribution of faculty according to two possible definitions of inbreeding are shown in Tables 11 and 12. Table 11 shows the distribution in terms of number and per cent (for each rank) of individuals, for each of the colleges of the University of Minnesota, who held their doctorate degrees from Minnesota. Table 12 shows the proportions of Ph.D. holders teaching in each college of the University of Minnesota who held degrees from more than one institution. Thus from Table 11 it can be seen that for the University as a whole, 44 per cent of the individuals who held doctorates had received them from the University of Minnesota. Similarly, Table 12 shows that, of those individuals who held doctorate degrees, 65 per cent had degrees of some kind from more than one institution. Whether either of these figures represents a high or low level of inbreeding depends upon your attitude toward the matter.

Turnover: --In the 1931 study a measure of turnover was developed which was defined as the ratio of resignations or new appointments (whichever is smaller) to the total number of faculty at a given rank. Using this same index for the sake of comparability, turnover statistics were computed for each of the professorial ranks of the faculty for the years 1929-30, 1939-40, and 1949-50 as shown in Table 16. The turnover index at the assistant professor level and consequently for all professorial ranks combined, was found to be considerably higher in 1949-50 than it was for either of the two earlier years. Turnover indexes for professors tended to remain relatively stable over the 20-year span.

The Effect of Inbreeding: --Tables 22, 28, 33, and 36 in your notebook illustrate the kinds of data compared for persons who received one or more degrees at the University of Minnesota with those with no degrees from the University--identifiable measures of experience, numbers of research papers published, a combined publication index, and the receipt of salary increases concurrent with promotions in rank. Only a few statistically significant differences were found, in such things as length of academic experience prior to promotion (in favor of non-Minnesota degree holders) and length of time at a certain rank before promotion (Minnesota degree holders stayed longer than holders of degrees from other institutions).

John E. Stecklein

TABLE 11. NUMBERS AND PERCENTAGES OF DOCTORATE HOLDING FULL-TIME ACADEMIC STAFF OF 1950-51 AT THE UNIVERSITY OF MINNESOTA WITH DOCTORATE FROM MINNESOTA, BY RANK AND COLLEGE.

	RANK									
	Professor		Associate Professor		Assistant Professor		Instructor		All Ranks	
College	N	%	N	%	N	%	N	%	N	%
Science, Literature and Arts	16	24	13	39	18	30	4	36	51	30
Institute of Technology	7	29	7	54	9	45	1	17	24	38
Agriculture	19	53	15	62	10	67	6	86	50	61
Medicine	15	48	11	58	9	53	16	70	51	57
Education	6	40	2	15	2	40	1	100	11	32
Duluth Branch	3	50	4	40	2	8	-	-	9	21
Other Colleges	20	62	2	22	5	56	1	100	28	55
All Colleges[a]	83	40	50	45	53	42	29	59	215	44

[a] Duluth Branch excluded.

TABLE 12. NUMBERS AND PERCENTAGES OF DOCTORATE HOLDING FULL-TIME ACADEMIC STAFF OF 1950-51 AT THE UNIVERSITY OF MINNESOTA WITH DEGREES FROM MORE THAN ONE INSTITUTION, BY RANK AND COLLEGE.

	RANK									
	Professor		Associate Professor		Assistant Professor		Instructor		All Ranks	
College	N	%	N	%	N	%	N	%	N	%
Science, Literature and Arts	48	71	24	73	48	80	7	64	127	74
Institute of Technology	15	62	8	62	14	70	3	50	40	63
Agriculture	22	61	16	67	10	67	4	57	52	63
Medicine	18	58	10	53	11	65	8	35	47	52
Education	13	87	11	85	3	60	1	100	28	82
Duluth Branch	4	67	8	80	16	64	1	50	29	67
Other Colleges	16	50	7	78	5	56	-	-	28	55
All Colleges[a]	132	64	76	68	91	72	23	47	322	65

[a] Duluth Branch excluded.

TABLE 16. TURNOVER BY PROFESSORIAL RANK AT THE UNIVERSITY OF MINNESOTA FOR THREE ACADEMIC YEARS: 1929-30, 1939-40 AND 1949-50.[a]

	RANK							
Year	Professor		Associate Professor		Assistant Professor		All Professorial Ranks	
	N	Turnover	N	Turnover	N	Turnover	N	Turnover
1929-30	155	1.9%	84	4.7%	159	5.7%	398	4.0%
1939-40	211	1.4	120	2.5	185	4.9	516	2.9
1949-50	246	1.6	165	4.2	219	7.8	630	6.7

[a] The turnover statistic (expressed as a percentage) is defined as the ratio of resignations or new appointments (whichever is smaller) to the total number of faculty at a given rank. Promotions are included in yearly totals but are not otherwise figured in yearly turnover. For example, during the year 1949-50, 246 individuals held full-time appointments as full Professor; of these, 4 were new appointments, and 16 appointments terminated during the year (2 resigned or were not reappointed, 10 retired, and 4 died). The turnover percentage is computed as 100(4 ÷ 246) = 1.6%, since the number of new appointments is less than the number of terminations.

Data for 1929-30 and 1939-40 from "Some Trends in Personnel Statistics of the Faculties of the University of Minnesota Relevant to Post-War Planning," September 1943. Table 1; Duluth Branch excluded.

TABLE 22. YEARS OF ACADEMIC EXPERIENCE OF 1950-51 FULL-TIME PROFESSORIAL STAFF MEMBERS AT THE UNIVERSITY OF MINNESOTA, BY RANK AND SOURCE OF DEGREE.[a]

	RANK											
	Professor			Associate Professor			Assistant Professor			All Professorial Ranks		
Years of Academic Experience	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total
0.00-0.49	28	20	48	14	11	35	27	12	39	79	43	122
0.50-1.49	18	10	28	9	7	16	16	21	37	43	38	81
1.50-2.49	13	10	23	12	9	21	14	27	41	39	46	85
2.50-3.49	13	15	28	8	6	14	11	11	22	32	32	64
3.50-5.49	19	11	30	11	11	22	15	19	34	45	41	86
5.50 and more	22	73	95	16	31	47	17	26	43	55	130	185
No Information	1	2	3	1	-	1	3	1	4	5	3	8
Totals	114	141	255	81	75	156	103	117	220	298	333	631

[a] Academic experience includes administrative, supervisory, teaching, and research positions as well as service fellowships and assistantships in schools, colleges or universities; Source of Degree refers to holders of one or more Minnesota degrees vs. holders of degrees from other institutions only; Duluth Branch excluded.

TABLE 28. AVERAGE ANNUAL NUMBER OF RESEARCH PAPERS PUBLISHED BY 1950-51 FULL-TIME PROFESSORIAL STAFF MEMBERS AT THE UNIVERSITY OF MINNESOTA, BY RANK AND SOURCE OF DEGREE, FOR THE THREE-YEAR PERIOD 1948-51.[a]

Number of Research Papers	RANK											
	Professor			Associate Professor			Assistant Professor			All Professorial Ranks		
	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total
0.0	21	26	47	22	21	43	53	55	108	96	102	198
0.1-0.5	19	17	36	14	9	23	13	18	31	46	44	90
0.6-1.0	22	22	44	12	15	27	12	20	32	46	57	103
1.1-2.5	17	34	51	16	13	29	14	14	28	47	61	108
2.6-5.0	19	32	51	14	11	25	7	10	17	40	53	93
5.1 or more	16	10	26	3	6	9	4	-	4	23	16	39
Totals	114	141	255	81	75	156	103	117	220	298	333	631

[a] Average annual number of publications obtained by dividing the number of publications of research papers, original journal articles on research projects and other articles (including tape recordings of papers and articles) by the number of years service during the three year period; Source of Degree refers to holders of one or more Minnesota degrees vs. holders of degrees from other institutions only; Duluth Branch excluded.

TABLE 33. TOTAL PUBLICATIONS INDEX OF 1950-51 FULL-TIME PROFESSORIAL STAFF MEMBERS AT THE UNIVERSITY OF MINNESOTA, BY RANK AND SOURCE OF DEGREE, FOR THE THREE-YEAR PERIOD 1948-51.[a]

	RANK											
	Professor			Associate Professor			Assistant Professor			All Professorial Ranks		
Publications Index	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total
0.0	10	12	22	16	9	30	44	36	80	70	62	132
0.1-3.0	15	12	27	12	1	13	15	16	31	42	29	71
3.1-6.0	12	16	28	8	18	26	9	25	34	29	59	88
6.1-9.0	12	12	24	10	4	14	6	7	13	28	23	51
9.1-12.0	8	10	18	11	10	21	7	9	16	26	29	55
12.1-19.0	14	28	42	8	8	16	8	10	18	30	46	76
19.1-29.0	21	26	47	5	11	16	6	9	15	32	46	78
29.1 or more	22	25	47	11	9	20	8	5	13	41	39	80
Totals	114	141	255	81	75	156	103	117	220	298	333	631

[a] The total publications index represents differential weighting of average annual publications obtained by dividing the number of publications in each category by years in service during three year period and summing the weighted averages: books or monographs (9), bulletins, pamphlets, parts of books or monographs (5), research papers, original journal articles, etc. (6), reviews and editorials (2), syllabi, abstracts, etc. (1) and creative works of art and science (5); Source of Degree refers to holders of one or more Minnesota degrees vs. holders of degrees from other institutions only; Duluth Branch excluded.

TABLE 36. RECEIPT OF SALARY INCREASE WITH PROMOTION FROM RANK OF ASSISTANT PROFESSOR TO RANK OF ASSOCIATE PROFESSOR BY 1950-51 FULL-TIME PROFESSORIAL STAFF MEMBERS AT THE UNIVERSITY OF MINNESOTA, BY RANK AND SOURCE OF DEGREE.[a]

Receipt of Salary Increase Upon Promotion	RANK								
	Professor			Associate Professor			Both Professorial Ranks		
	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total	Univ. of Minn.	Other Institutions	Total
YES	73	49	122	61	49	110	134	98	232
NO	17	8	25	4	2	6	21	10	31
No Information	-	-	-	1	-	1	1	-	1
Does not apply[b]	24	84	108	15	24	39	39	108	147
Totals	114	141	255	81	75	156	195	216	411

[a] Source of Degree refers to holders of one or more Minnesota degrees vs. holders of degrees from other institutions only; Duluth Branch excluded.

[b] Does not apply indicates that no opportunity was available for a salary increase with the promotion under consideration.

The individual who instigated the study of inbreeding remained unconvinced, however, and perhaps quite legitimately asserted that this study did not measure the kinds of bad influences, which result from too much inbreeding, such as lack of new ideas, lack of growth and limited perspective.

Faculty Functions, Duties, and Responsibilities

A second type of study of faculty is concerned with what a faculty does--analyses of faculty functions, duties, and responsibilities--frequently referred to as a faculty work load study. I would like to suggest that the periodic collection of faculty work load data is valuable completely aside from the cost study emphasis frequently given it, because it provides an up-to-date picture of what faculty members are doing and a basis for comparison of faculty activities at intervals in the development of the institution.

A good administrator should have a clear picture of the distribution of activities among the staff members of his unit and comparative information about staff members of other units, in order to recognize inequities in assignments and to promote the most efficient utilization of faculty resources that is possible within the philosophy of the institution. This is not to say that a standard should be set up for all college staff members in all departments, but such data can provide a yardstick against which performances that deviate widely from the typical practice of staff members in a particular unit might be studied carefully, to determine whether such deviation is warranted or whether it in fact represents lackadaisical, indifferent, or even lazy performance. Ideally, faculty work load data should be available for other institutions of comparable size and purpose, again not to establish a standard but to provide comparative information on institutional practices and utilization of faculty.

Faculty Work Load Studies

Three comprehensive faculty work load studies have been made at Minnesota since 1940. The first, based on faculty employed at the University during the 1940-41 academic year, was conducted to meet the criticism that a description of faculty loads exclusively in terms of teaching responsibility did not provide an adequate picture of staff activities. A five page information blank, edited and revised according to faculty suggestions, was sent to each faculty member at the end of each quarter of the 1941-42 academic year. Each person was asked to indicate, for each quarter of that year, the amount of time he spent (generally in terms of the number of hours during the quarter) on teaching activities, individual counseling and advising, administrative activities, other kinds of campus activities, research and writing, and off-campus service activities. Separate data were requested for each person's responsibilities for regular day-time classes, for general extension classes, and for correspondence classes. The data were then analyzed and comparisons made for each of the several colleges of the University.

As might be expected, considerable variation was found in the total work loads reported by the staff members: a fourth of all of the faculty indicated that they spent 40 hours or less per week in all types of services; another fourth described loads that totalled 70 hours or more per week. Marked variations were also found in the different kinds of activities performed by members of the different faculties. The median number of hours worked per week, however, ranged from 55 hours for business administration faculty to 60 hours for members of the General College faculty.

Just as the 1941-42 study of faculty activities had been suggested by President Coffey, the 1950-51 load study was initiated by President J. L. Morrill, who sensed the inevitability of budget retrenchment as a result of the Korean situation. He believed a comprehensive study of faculty activities would be helpful in appraising programs, in evaluating or equalizing faculty work loads, and in documenting needs to the Board of Regents and the legislature. The forms and procedures used in the 1941-42 study were adopted and modified slightly for the study. This made it possible to collect the information and make analyses within two months after the study was proposed.

To validate the time estimates given by faculty members for their activities in the questionnaire study, a sample of these persons was asked to keep diaries or day-to-day accounts of their activities for a prescribed period of time during subsequent quarters. Analysis of these reports showed very close agreement with the estimates which the faculty members had made on the survey forms and the results seemed to substantiate the ability of individuals to estimate the allocation of time accurately. The summary report of the 1950-51 faculty load study at Minnesota and the multitude of tabulations resulting from the analysis of these data are available in the reference library, for those of you who are interested.

Differences in Faculty Activities

A third study of faculty load at Minnesota emerged as a substudy using the data collected in the California-Western Conference Cost and Statistical Study. Inasmuch as this project was intended primarily to collect cost data, the method of data collection was considerably different from that used in the two previous studies. In order to facilitate conversion of time spent by faculty members on certain activities into the dollar amounts representing the cost of those activities to the institution, data were collected showing the percentage of time which each faculty member spent on a list of major activities usually performed by college teachers.

(Out of curiosity the figures thus obtained were compared with the figures obtained in the earlier 1941-42 and 1950-51 faculty load studies.

The proportions of time reportedly spent on various activities by the faculties in the three studies seldom differed by more than five per cent, when the data from the earlier studies were converted from number of hours per week to percentages of the total number of hours worked per week. In one college, for example, the 1941-42 study indicated that the median proportion of faculty time spent on teaching was 49.9 per cent. This figure compares with 46.2 per cent for the 1950-51 study and 54.5 per cent for the 1954-55 study. The three figures for administrative activities were 8.6, 3.0, and 2.6 per cents, respectively, for the three studies in chronological order, and for public and professional services the figures were 8.7 per cent, 11.0 per cent, and 6.5 per cent. Another analysis for this particular college faculty indicated that the percentages of staff who participated in no research during the years under study were 47.6, 47.3, and 46.9, respectively. Although additional comparative studies have not yet been completed, the initial impression is that, even with the variability expected due to changes in personnel and programs, the data gathered in the two way described provide essentially the same kind of results.)

Tables B-1, B-2, and B-3 in your study materials illustrate one way of presenting load statistics taken from cost study data. They provide a picture of the relative activity of members of the academic ranks in three selected colleges, in terms of the proportions of their time spent on teaching, research, administration, and public and professional services.

Comparisons of staff activities between ranks and between colleges can be made more easily, however, if summary data are pulled together for specific functions and specific allocations of time to these functions. Table B-1 illustrates one kind of comparison that was made for discussion at a college faculty meeting. The differential functions of the three different types of colleges--Education, Agriculture, and Science, Literature, and the Arts--are clearly reflected by the proportions of staff time spent among teaching, research, and public and professional services. For instance, very little difference is found between the proportions of full professors in SLA and Education that spend 50 per cent or more of their time teaching, but there is a marked difference between the professors in these two colleges and the professors in the College of Agriculture in this respect. In contrast, the participation in research of professors in the College of Agriculture is much greater than that of the professors in the other two colleges. The right hand column headed Public and Professional Services for the Professor group indicate that professors in the Colleges of Education and Agriculture devote much more time to public and professional services than do SLA professors. Similar comparisons of the activities of members of the other ranks of the three colleges are also quite informative.

Table B-1

A COMPARATIVE DISTRIBUTION OF FACULTY TIME

Education, SLA & Agriculture

	Teaching 50% or more time			Research 5% or less time			Public & Prof. Serv. More than 10% time		
	Educ.	Agric.	SLA	Educ.	Agric.	SLA	Educ.	Agric.	SLA
Professor	56.6	11.5	53.5	69.7	13.1	32.1	52.2	45.9	11.9
Assoc. Professor	57.2	19.5	78.3	64.3	17.0	37.8	42.8	51.2	6.7
Asst. Professor	54.6	31.0	90.0	63.7	40.4	39.4	27.3	26.2	4.5
Instructor	50.0	37.4	76.7	93.7	53.2	71.4	12.5	9.4	1.8
TOTAL	54.7	22.7	73.6	73.5	27.8	43.2	36.0	35.8	6.8

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Table B-2 SUMMARY OF MEAN PER CENTS OF TIME SPENT BY FACULTY MEMBERS ON TEACHING ACTIVITIES, TABULATED BY TYPE AND LEVEL OF INSTRUCTION AND BY RANK, FOR THREE SELECTED COLLEGES - ACADEMIC YEAR 1954-55.

		Rank											
		Teach. Ass'ts.		Instructor		Asst. Prof.		Assoc. Prof.		Professor		All Ranks	
Type	Level	% of Full Time	% of Tchg. Time	% of Full Time	% of Tchg. Time	% of Full Time	% of Tchg. Time	% of Full Time	% of Tchg. Time	% of Full Time	% of Tchg. Time	% of Full Time	% of Tchg. Time
College A													
All Types	Lower	38.1	90.9	35.3	75.8	24.5	42.9	12.6	27.2	6.4	18.1	25.8	57.8
	Upper	3.2	7.6	7.3	15.7	20.5	35.9	18.1	39.0	12.8	36.2	10.6	23.8
	Graduate	0.6	1.5	4.0	8.5	12.1	21.2	15.7	33.8	16.2	45.7	8.2	18.4
Lect. & Disc.	All levels	26.5	63.2	43.2	92.7	50.8	89.0	40.1	86.4	32.0	90.4	37.1	83.2
Laboratory	All levels	15.4	36.8	3.4	7.3	6.3	11.0	6.3	13.6	3.4	9.6	7.5	16.8
All Types	All levels	41.9	100.0	46.6	100.0	57.1	100.0	46.4	100.0	35.4	100.0	44.6	100.0
College B													
All Types	Lower	27.5	65.8	42.4	61.3	26.0	44.1	16.6	29.2	9.1	23.6	25.0	49.0
	Upper	13.1	31.3	25.0	36.2	27.2	46.1	29.4	51.6	16.0	41.4	20.3	39.8
	Graduate	1.2	2.9	1.7	2.5	5.8	9.8	10.9	19.2	13.5	35.0	5.7	11.2
Lect. & Disc.	All levels	10.4	24.9	37.2	53.8	34.1	57.8	39.7	69.8	30.4	78.8	27.1	53.1
Laboratory	All levels	31.4	75.1	31.9	46.2	24.9	42.2	17.2	30.2	8.2	21.2	23.9	46.9
All Types	All levels	41.8	100.0	69.1	100.0	59.0	100.0	56.9	100.0	38.6	100.0	51.0	100.0
College C													
All Types	Lower	2.8	100.0	43.2	75.8	44.1	65.5	36.9	52.8	25.7	44.8	40.0	64.1
	Upper	0.0	0.0	13.8	24.2	23.2	34.5	33.0	47.2	30.4	53.0	22.3	35.7
	Graduate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.2	0.1	0.2
Lect. & Disc.	All levels	0.0	0.0	31.8	55.8	48.0	71.3	59.0	84.4	46.4	80.8	43.9	70.4
Laboratory	All levels	2.8	100.0	25.2	44.2	19.3	28.7	10.9	15.6	11.0	19.2	18.5	29.6
All Types	All levels	2.8	100.0	57.0	100.0	67.3	100.0	69.9	100.0	57.4	100.0	62.4	100.0

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Table B-3 NUMBER AND PER CENT OF FULL-TIME ACADEMIC STAFF MEMBERS IN COLLEGE B, DEVOTING SPECIFIED PROPORTIONS OF TIME TO VARIOUS FUNCTIONS, ARRANGED ACCORDING TO RANK

Rank (by per cent of time)	Function															
	Teaching		Dept. Research		Org.&Spons. Research		Total Research		Dept. Admin.		General Admin.		Pub.&Prof. Services		Student Services	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Professor																
0%	1	6.2	14	87.5	16	100.0	14	87.5	4	25.0	6	37.5	11	68.8	16	100.0
1-5%	0	-	1	6.2	0	-	1	6.2	1	6.3	4	25.0	3	18.8	0	-
6-10%	1	6.2	0	-	0	-	0	-	4	25.0	0	-	1	6.2	0	-
11-20%	1	6.2	0	-	0	-	0	-	2	12.5	2	12.5	0	-	0	-
21-49%	3	18.8	1	6.3	0	-	1	6.3	4	25.0	2	12.5	1	6.2	0	-
50-79%	5	31.3	0	-	0	-	0	-	0	-	0	-	0	-	0	-
80-100%	5	31.3	0	-	0	-	0	-	1	6.2	2	12.5	0	-	0	-
Total	16	100.0	16	100.0	16	100.0	16	100.0	16	100.0	16	100.0	16	100.0	16	100.0
Assoc. Prof.																
0%	0	-	11	84.6	12	92.3	11	84.6	6	46.1	11	84.6	10	76.9	13	100.0
1-5%	0	-	0	-	0	-	0	-	1	7.7	2	15.4	2	15.4	0	-
6-10%	0	-	1	7.7	0	-	0	-	5	38.5	0	-	1	7.7	0	-
11-20%	1	7.7	0	-	0	-	0	-	0	-	0	-	0	-	0	-
21-49%	0	-	1	7.7	0	-	1	7.7	1	7.7	0	-	0	-	0	-
50-79%	2	15.4	0	-	1	7.7	0	-	0	-	0	-	0	-	0	-
80-100%	10	76.9	0	-	0	-	1	7.7	0	-	0	-	0	-	0	-
Total	13	100.0	13	100.0	13	100.0	13	100.0	13	100.0	13	100.0	13	100.0	13	100.0
Ass't Prof.																
0%	0	-	51	94.4	53	98.1	50	92.6	45	83.3	53	98.1	52	96.3	50	92.6
1-5%	0	-	2	3.7	0	-	2	3.7	1	1.9	1	1.9	2	3.7	2	3.7
6-10%	1	1.9	1	1.9	1	1.9	2	3.7	3	5.5	0	-	0	-	0	-
11-20%	0	-	0	-	0	-	0	-	3	5.5	0	-	0	-	0	-
21-49%	0	-	0	-	0	-	0	-	1	1.9	0	-	0	-	1	1.9
50-79%	10	18.5	0	-	0	-	0	-	1	1.9	0	-	0	-	0	-
80-100%	43	79.6	0	-	0	-	0	-	0	-	0	-	0	-	1	1.8
Total	54	100.0	54	100.0	54	100.0	54	100.0	54	100.0	54	100.0	54	100.0	54	100.0

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College B, continued

Rank (by per cent of time)	Function															
	Teaching		Dept. Research		Org.&Spons. Research		Total Research		Dept. Admin.		General Admin.		Pub.&Prof. Services		Student Services	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Instructor																
0%	0	-	26	100.0	26	100.0	26	100.0	26	100.0	26	100.0	26	100.0	25	96.2
1-5%	1	3.8	0	-	0	-	0	-	0	-	0	-	0	-	0	-
6-10%	1	3.8	0	-	0	-	0	-	0	-	0	-	0	-	0	-
11-20%	1	3.8	0	-	0	-	0	-	0	-	0	-	0	-	0	-
21-49%	1	3.8	0	-	0	-	0	-	0	-	0	-	0	-	0	-
50-79%	5	19.3	0	-	0	-	0	-	0	-	0	-	0	-	0	-
60-100%	17	65.5	0	-	0	-	0	-	0	-	0	-	0	-	1	3.8
Total	26	100.0	26	100.0	26	100.0	26	100.0	26	100.0	26	100.0	26	100.0	26	100.0
All Ranks																
0%	1	0.9	102	93.6	107	98.2	101	92.7	81	74.3	96	88.2	99	90.9	104	95.5
1-5%	1	0.9	3	2.8	0	-	3	2.8	3	2.8	7	6.4	7	6.4	2	1.8
6-10%	3	2.8	2	1.8	1	0.9	2	1.8	12	11.0	0	-	2	1.8	0	-
11-20%	3	2.8	0	-	0	-	0	-	5	4.6	2	1.8	0	-	0	-
21-49%	4	3.7	2	1.8	0	-	2	1.8	6	5.5	2	1.8	1	0.9	1	0.9
50-79%	22	20.1	0	-	1	0.9	0	-	1	0.9	0	-	0	-	0	-
80-100%	75	68.8	0	-	0	-	1	0.9	1	0.9	2	1.8	0	-	2	1.8
Total	109	100.0	109	100.0	109	100.0	109	100.0	109	100.0	109	100.0	109	100.0	109	100.0

Administrative Unit, Bureau of Institutional Research
University of Minnesota, 10/57

Amount, Level, and Types of Teaching Duties

Equating the results of this analysis to those from still another method of studying faculty load, i.e., from data collected routinely as an inventory of courses and faculty teaching assignments, produces some intriguing figures. Among such figures are these, based on a preliminary study for one college of the University: For each clock hour of class assigned to him the full professor spends 4.8 per cent of his total professional time. This percentage includes time spent upon class preparation, class meetings, grading papers, and student advising connected with the course. In comparison, the associate professor spends 4.9 per cent and the assistant professor 5.6 per cent of his total professional time, respectively. As one might expect, the allocation of time increases as the level of instruction goes up. The full professor in this college, for example, spends, on the average, 4.4 per cent of his time per clock hour for lower division instruction compared with 4.7 per cent and 5.9 per cent per clock hour for instruction at the upper division and graduate levels, respectively. If such figures can be developed and validated over a period of years, administrators will be much better prepared to weight the various responsibilities assigned to their staff members, and to judge relative efficiency.

Faculty Attraction and Retention

I would like to discuss institutional research on staffing problems by describing what I consider to be a prime example of effective utilization by the faculty of our Bureau. In 1957 the members of the Senate Committee on Education found themselves involved in an earnest discussion of the problems of recruiting and holding competent faculty members during the next five or ten years. As a result of this discussion, a subcommittee was appointed to study faculty attraction and retention and the Bureau was asked for assistance. After a preliminary meeting of the subcommittee and the director of the Bureau, the director was asked to bring to the subcommittee specific recommendations for the proposed study. Members of the Bureau staff then drew up a tentative research design which was thoroughly discussed, modified, and approved in outline form by the subcommittee. Four groups of present and prospective faculty members of the University were recommended for careful study, to identify factors which are most influential in causing prospective faculty members to accept or reject invitations to come to the University, or in causing present faculty members to leave or stay at the University. The two groups of on-campus staff members--individuals who had joined the full-time faculty for the first time within the past two years, and individuals who had turned down offers to take positions elsewhere within the past two years--would be studied by intensive interviews. The other two groups--persons who had left the University within the past two years to take positions elsewhere and individuals who had turned down job offers from the University of Minnesota--would be studied by questionnaire techniques.

After the four groups had been defined, members of the Bureau staff developed the questionnaires and interview guides, using comments and suggestions of members of the advisory committee. The Bureau then distributed the forms and conducted the interviews, and analyzed the data collected. Members of the Bureau staff wrote up a rough draft report which was sent to the individual committee members for their review, comments, and criticism. The report is now being revised in the light of these criticisms and a final report is expected early this fall. Incidentally, I believe that you will be interested in the way in which the relationship of the subcommittee and *its* responsibility for a report, and the Bureau staff and *its* responsibility for a report, was worked out. It was agreed that members of the Bureau staff would write a complete report covering all four phases of the study, including a section called conclusions and implications. The subcommittee, on the other hand, using a preliminary draft of the findings, would write a separate paper consisting entirely of recommendations concerning faculty attraction and retention, supporting their recommendations with findings from the studies. The *committee's* report will be distributed to all faculty members and administrators in the University and will be available to other interested parties. Similarly, the *Bureau's* report will be available to any faculty member or other person who is interested in studying the complete findings.

I can only give you a brief preview of the outcomes of these studies but I thought you would be interested in a few of the findings. One of the questions asked concerned differences between salaries offered in positions taken elsewhere and salaries of positions at the University. We found that individuals who left the University (and this population was restricted to staff members whom the deans and department heads would most like to have kept on their staff, in order to exclude persons whom the department heads might have released anyhow) took positions elsewhere with salary increases averaging 21 per cent over the salaries which they had received, or had reason to believe they would have received, at the University if they had stayed. One-fourth of the respondents indicated salary increases exceeding 30 per cent. On the other hand, that *salary* is not the whole issue is reflected by the fact that 41 per cent of those who turned down offers to come to Minnesota accepted jobs elsewhere paying as much as 20 per cent less than the Minnesota offer.

When asked to identify the factors which were most influential in their decision to come to the University or to stay at the University, the most frequently cited factor was the prestige of the institution and reputation of the staff members. The matter of salary was mentioned as important but was not the top factor in any instance. Better opportunity for advancement and better distribution of working responsibilities were also listed high among the factors influencing a change to other institutions or a change to the University of Minnesota, while climate, the metropolitan setting of the University, and the proximity of friends and relatives played a minor role in the decisions of nearly all of the individuals studied. The importance of the attitude of the department head or dean was brought out strikingly, too, in several of the questionnaire responses and interview replies, either as such attitudes increased the person's incentive to leave the institution or as they conveyed appreciation and respect for the individual's work--often all that was needed to cause a person to turn down an offer to go elsewhere. If any of you are interested in further details of the study, copies of the report will be sent to you upon request when they are made available this fall.

These, in brief, are the kinds of research studies we have done *about* the University of Minnesota faculty. In the next chapter, I will review some studies the Bureau has done *on behalf of* individual faculty members, departments, and colleges of the University.

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VIII. Research Done for the Faculty

. . . . John E. Stecklein

The studies described in Chapter VII, with only a few exceptions, were sponsored by all-university committees or by committees representing the University Senate.

Another type of study is often made by the Bureau, however, in which research is focused upon a problem of a particular college or department, or in some cases, around the special interest of an individual faculty member. Prime examples of the former are the study of the Role of Foreign Languages in the College of Science, Literature and the Arts, and the analysis of achievement in general education courses of the SLA college. Examples of studies conducted in cooperation with individual faculty members include studies of teaching methods, class size, testing programs, and work on test development.

Role of Foreign Language

In 1947, the College of Science, Literature, and the Arts at the University of Minnesota, adopted a program whereby a students was given the option of taking work in a Foreign Language (called Plan 1) or work in a variety of humanities courses (called Plan 2) as part of his required work in the lower division of that college. When the plan was initiated, the faculty stipulated that the program should be reviewed at the end of five years in order to determine what effect the option had had upon the departments involved, and upon the work of the students. In 1955 the Bureau of Institutional Research was asked to work with the special committee appointed to study the effects of the Plan 1 - Plan 2 option.

The three-fold study included (1) a special analysis of all the courses taken by the first group of students affected by the option during the following four years, (2) a questionnaire study of all faculty members in the SLA College concerning the importance of foreign languages to them, and (3) an intensive interview study of the teachers of foreign language, to collect in a consistent fashion their views concerning the need for foreign language study as part of the lower division requirement in this college. Because you will be able to read the report of the study at your leisure, I will not spend much time on the detailed results of the study.

Briefly, the study of student records indicated that one-third of the first class to be affected by the Plan 1-Plan 2 option had taken no foreign language in college, and 18 per cent had had no foreign language in either high school or college. These results, in my view, did not indicate a mass avoidance of foreign language under the option. The majority of the SLA faculty indicated a preference for the continuation of the option, while the foreign language teachers advocated reinstatement of the foreign language requirement. The special committee finally recommended that the option be abolished and that the study of foreign languages again be required of all students who take lower division work in the SLA college.

Actions such as this represent one of the frustrations of a person in institutional research. The mere establishment of an institutional research unit does not in itself guarantee that decisions will be made on a more realistic, objective, and reasonable basis. As you can see, even in our institution, with its long tradition of faculty-oriented institutional research, faculties and faculty committees have been known to make decisions on other than a purely objective basis.

Evaluation of Student Achievement in General Education

In further keeping with the Minnesota tradition of self-scrutiny, another example of less-than-desirable expectation and utilization of the Bureau's services appears to be in order. Due to increased restiveness of certain faculty members about the general education unit of the College of Science, Literature, and the Arts--the General Studies department--the SLA Dean appointed a special committee on general education to study all general education provisions of the college.

I shall not take the time to go into the reasons for the faculty restiveness; as you can imagine, the reasons were many and varied, but the reason which was most frequently stated was that there was some uncertainty as to the value and quality of the courses offered by the General Studies department. Several individuals teaching in the basic subject fields felt that the kinds of courses offered by the General Studies department did not provide the kind of general education that the students should have, and that the introductory courses in the basic subject fields would better serve the purpose. Others flatly stated that the courses offered were not of college level.

When members of the Bureau staff met with the committee to assist in planning the studies, the committee did not have a clear idea of exactly what it was supposed to do or where to start. The Bureau was asked to make a few limited studies of costs, of departmental growth, and of student enrollment, and to design a questionnaire to be sent to faculty members (which was not sent), but in general, no unified concept of research was evolved.

One of the major questions which the committee wanted to resolve was the effectiveness of the course offerings of the General Studies department. But the committee tied the hands of the Bureau staff by insisting that the study would have to be based upon available data. It did not want to enter into any long range research study which would require the development of tests, test administration and data analysis that would require many months to complete. Inasmuch as only one set of college achievement test scores were available for the General Studies students--the Sophomore General Culture Test--and this test was not well-suited to the purpose, a severe limitation was imposed upon the research design.

The quality of the students who enrolled only in the General Studies courses was compared with the quality of students who enrolled only in the conventional introductory courses, as measured by high school rank, ACE test scores, and Cooperative English Test scores. Scores on the Sophomore General Culture test achieved by students who satisfied their lower division requirements by taking all of their course work in the General Studies department were compared with scores achieved by students who satisfied their lower division requirements by taking all of their course work in the regular subject matter departments, in order to see whether there was a significant difference between the achievement of these two groups. No statistically significant differences were found, either in student quality or in Sophomore General Culture test scores.

While it was recognized that the generalizability of these research findings was quite limited, the analysis did provide the only available objective information about the relative value of the two types of courses. But the findings of this research apparently had little effect upon the committee because it recommended the curtailment of control of the General Studies department over its course offerings and staffing and the establishment of three interdisciplinary committees composed of staff members from the conventional departments, to assume control.

Interestingly, a minority report, which made an even stronger recommendation to abolish the unit as a department and replace it with a program, quoted the results of the study, but reversed the implications to suggest that, inasmuch as the special general education courses were doing no better than the conventional introductory courses, there was no need for them. This represented a slight reversal from the earlier complaint that General Studies courses were not as good as the basic subject matter courses.

You will be interested to know that the SLA college faculty subsequently supported the recommendations of the minority report.

The Bureau of Institutional Research did not provide an effective and useful service to this faculty committee, partly because of the time limitations imposed, but more importantly, in my estimation, because the members of the committee did not really seek objective and unbiased data concerning the problems which they were considering. An institutional research unit, whether it be a single person devoting part or full time to the activity or whether it be a fully established research bureau, can only be as effective as the data which are available, the amount of time made available for research, and the intentions of the person or group for whom the research is being conducted, permit.

Research Involving the Teaching Process

Many comparative studies of methods of instruction, both formal and informal, are conducted each year throughout the country, and one could devote the whole institute to the discussion of such studies. I will restrict my attention this morning to a sample of the kinds of studies which have been conducted at the University of Minnesota. Your attention is also called to the brief survey and critique of published research on class size and teaching methods among your bibliographic materials, for an overview of the subject. This report was written by a Bureau staff member for distribution to all deans and department heads in the University, both as a means of informing them of research of this type and to encourage possible experimentation in these areas. Today, I will give you brief descriptions of comparisons of teaching methods in physics, physiology, and psychiatry, a study of class size, and a study of the use of student ratings of instruction and leave the details to the reports which you have.

Good experimental studies of teaching methods or class size are very difficult to develop, especially on any large scale. Prohibitive obstacles include deans and department heads who do not want their carefully structured registration procedures and class schedules to be disrupted and faculty members who do not want to teach any heavier loads than they have to, either in terms of more classes or more students, even for the sake of research which might benefit them in the long run. Other problems include drop-out of students, the need for large enrollments, random assignment of students, establishment of control sections, adequate development, refinement, and pilot administration of measuring instruments, and experiment contamination by informational exchanges between students in the experimental and control groups.

Methods of Instruction and Class Size

In the experimental study conducted in elementary physics, the Bureau staff worked closely with one member, and received advisory assistance from other members of the physics department, in developing measuring instruments and in designing the study; which is reported in Chapter 10 of A University Looks at Its Program. The experiment compared two methods of teaching elementary physics: (1) use of conventional laboratory experiments which the students were required to perform, and (2) use of instructor demonstrations of the experiments, with no direct student laboratory work.

Four types of tests were developed to measure the different types of achievement--one test of physics theory and three practical laboratory tests. In general, the laboratory groups showed higher scores on the three tests dealing with the laboratory material but no differences were noted between the groups on the theory tests.

A similar study, conducted with the physiology department, also involved two different methods of instruction for freshmen medical students--a straight-forward lecture technique and a lecture and seminar approach involving student discussion of basic research literature. Each method was shown to have advantages related to the specific objectives, but overall, no significant differences were noted.

A third study illustrates an experiment involving changes in behavior other than the usually measured achievement gains or losses. The purpose of the study, involving premedical students in their junior clerkships, was to determine whether changes in students' attitudes toward psychiatry would be associated with different sequences of clerkships. As the report in Chapter 15 of A University Looks at Its Program relates, such changes were found, and further experiments were encouraged.

Class Size

A study of class size is just being completed. In this project, comparisons were made of the effect upon student achievement of instruction in a business accounting course where the students were taught in classes of size 20, 40, and 80. This case illustrates beautifully how restrictions of schedules and registration procedures can restrict or even prevent a good experimental study in instruction. Several years ago, the Bureau was asked to draw up an experimental design for a class size study. When the design was sent to the department head who had requested it, he stated that the scheduling of classes and assignment of teachers could not be modified to satisfy the requirements of the experimental design. A modified experimental design which, although not ideal, permitted a certain number of comparisons of the effects of instruction in classes of different sizes, was again rejected as being impossible to set into operation.

Nearly three years later, one of the staff members of that department came to the Bureau for assistance in planning the same study of class size. Despite some misgivings, the Bureau helped plan an experiment which would provide some limited evidence concerning the effectiveness of instruction to classes of three different sizes. No significant differences were found between the achievement of the students in the classes of the various sizes.

Still another type of study evolved from both student and faculty interest in the evaluation of instruction by students. Once again Bureau staff members worked closely with a faculty committee, not only in the development and refinement of the several forms which were tried out and used, but in the mechanics of setting up the distribution and collection of the forms, and in the special analyses made to identify possible biasing influences upon student ratings. The study is reported in Chapter 23 of A University Looks at Its Program, and a sample copy of form D is included in this volume. These forms are still in use on a voluntary basis by faculty members in several of the colleges in the University. No administrative use has been made of these forms, however.

I have not discussed experimental studies involving the use of television. Although to date our Bureau has not been directly involved in any study of this type, the University Laboratory schools have a television study underway as part of their research program. Their experiment involves the use of closed circuit Television to enable student teachers to observe experienced teachers in the classroom without actually visiting the class. While this type of study might normally come within the scope of Bureau activities, the fact that this study is supervised by a former director of the Bureau and is financed by foundation funds, obviates the need for the Bureau's assistance.

Test Development and Analysis

Work with individual staff members or faculty groups in the development of comprehensive examinations and screening tests or new types of measuring instruments has been a part of the Bureau's activities since the first committee was formed. An example of the latter--the development of a listening test--is described in Chapter 11 in A University Looks at Its Program. Currently, the Bureau is participating in the development of a battery of music achievement tests, providing technical assistance in the writing of items, statistical item analysis, the development of norms, and the validation of the tests.

Conclusion

These chapters are, then a capsule description of research on and for the faculty at the University of Minnesota. I have probably tried to tell you too much in the amount of time available, but on the other hand, much more remains to be told. Although the several studies selected for your quick purview are too few to give a complete picture, they do reflect the great variety of studies which can and should be made of college and university faculties and the kinds of studies which individual faculty members should be motivated to do and assisted with, if the broad definition of institutional research is to prevail in an institution. Although much remains to be done to perfect such studies, still more research on and by the faculty is urgently needed if we are to understand better the operation of a college or university and the role of the faculty member in this operation.

Needed Research

For instance, we need to know what motivates a person to do a good job, or to do a particular job in preference to some other activity.

We need to know what makes one person so conscientious about meeting a deadline, serving well on a committee, turning out a good manuscript, meeting students, or preparing class lessons, that his own personal, family, and social life suffers as a result, while another person, ostensibly imbued with the same kinds of professional interests, and having essentially the same kind of background and training, will miss classes, fail to meet appointments, or fail to complete a committee assignment without any visible signs of dismay or guilt? What roles do administrators play as motivators or discouragers of research activity or instructional improvement? Will more free time for faculty members to think, write, and do research actually result in an increase in the amount of research and the number of manuscripts? Are the incentives too limited in terms of the present faculty rank and salary structures to encourage faculty members who have reached a certain rank or salary ceiling to continue to produce and grow?

Why can we not generate more interest in systematic and broad scale experimental studies of different class sizes or different methods of instruction? Would not a carefully designed systematic comparison of the effect upon instruction of different class sizes in 8 or 10 subject fields, conducted simultaneously in a sampling of institutions throughout the country, have more impact upon the current operation and scheduling of college and university programs today than do the multitude of isolated studies and armchair prescriptions which are currently being made?

Or do we need to make such kinds of studies? Do we already know what kinds of results will emerge? Is the problem really one of overcoming faculty apathy or plain stubborn resistance to change?

How will and how should the development of television influence the role of the faculty member in the college and university? Have those faculty members who have participated in educational television broadcasts changed their classroom habits and practices as a result of such participation? To what extent have their attitudes toward educational television been changed?

As you can see, if allowed to continue, my list of questions would far exceed the list of research studies which have already been completed. Research at Minnesota is in the planning stage or underway to provide answers to some of the questions just raised. But knowledge about what makes a college professor tick and how his services can be used to maximize simultaneously his efficiency, his satisfactions, and the quality of the educational product is so sketchy, that the attention and resources of hundreds of research units are needed to help fill this void.

UNIVERSITY OF MINNESOTA

Student Report on Classroom Teaching

Form D

Your instructors are anxious to make each course of greatest possible value to the students. In every course there is always room for improvement. Thoughtful student reactions to the work of the class have proved their worth to many instructors.

The present report form gives you an opportunity to pass on to the instructor your comments and suggestions without identifying yourself. Your ratings will be strictly anonymous. In addition, they will be summarized and reported in such a way that only your instructor will know what comments and suggestions are made about his class. You are asked to make your responses conscientiously and individually, since your ratings will be used in improving this course in coming quarters.

DIRECTIONS

Your ratings are to be indicated on this sheet. Select the one descriptive phrase under each item which best describes your instructor or his teaching, and **circle the letter in front of that response.** Work rapidly. Do not consult with classmates; make your own ratings. **Do not sign your name!** Circle **one** letter from each item to indicate the response you think is best.

Before beginning your ratings, please mark the following: to indicate

Your present college standing?

I Freshman   II Sophomore   III Junior   IV Senior   G Graduate Student   O Other

Your over-all grade average at this University?

A   B+   B   B–   C   C+   C–   D

The college of the University you are in?

A Institute of Technology   B Education   C Institute of Agriculture

D S.L.&A.   E General College   F Other____________________

Your sex? Male_______   Female_______

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1. **How clearly does your instructor present his subject matter?**
   A. Very clear in presentation
   B. Fairly clear
   C. Somewhat clear
   D. Not very clear
   E. Not at all clear in presentation

2. **How well does he adjust to your level of comprehension?**
   A. Nearly always adjusts to my level
   B. Usually adjusts to my level
   C. Adjusts to my level more often than not
   D. Adjusts to my level about half of the time
   E. Seldom adjusts to my level

3. **How interesting does he make the material?**
   A. Much more interesting than I expected
   B. Somewhat more interesting than I expected
   C. About as interesting as I expected
   D. Less interesting than I expected
   E. I thought the course would be a bore and it is

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4. How well does he seem to know the subject?
   - A. Thorough and profound scholarship
   - B. Knowledge broad and accurate
   - C. Well-rounded knowledge of the subject
   - D. Adequate knowledge
   - E. Occasional gaps in knowledge

5. What is the feeling between him and the students?
   - A. Extremely friendly in and out of class
   - B. Quite friendly with students
   - C. Rather friendly
   - D. Little warmth in relations with students
   - E. Rather unfriendly

6. How valuable are the text and other assigned readings?
   - A. Outstanding in value
   - B. Almost all parts are valuable
   - C. Generally valuable
   - D. Some parts are worth reading
   - E. A waste of time

7. Is class time well spent?
   - A. Every minute is well spent
   - B. Almost all class time is well spent
   - C. Time is usually well spent
   - D. Class time is often wasted
   - E. Class time is almost entirely wasted

8. How clearly are your responsibilities in this course defined?
   - A. I always know what is expected of me
   - B. I usually know what is expected of me
   - C. I usually have a general idea of what is expected of me
   - D. I often am in doubt about what is expected of me
   - E. I seldom know what is expected of me

9. Do you feel that you are able to get personal help in this course if you need it?
   - A. Can get a great deal of personal help from the instructor or assistants
   - B. Can get quite a bit of personal help
   - C. Can get a moderate amount of help
   - D. Can get a small amount of help
   - E. Can get no personal help from the instructor or assistants

10. Have grading policies thus far been fair?
    - A. Unusually or exceptionally fair
    - B. Fairer than most
    - C. As fair as the average instructor's policies
    - D. Unfair to some
    - E. Unfair to many

11. How much actual work outside of class do you do for this course?
    - A. An excessive amount for the number of credits received
    - B. More than average for the number of credits received
    - C. About average for the number of credits received
    - D. Less than average for the number of credits received
    - E. Very little for credits received

12. Would you recommend this course, in terms of its content, to a good friend whose interests are like yours?
    - A. Yes, recommend it highly
    - B. Yes, it is better than most courses
    - C. Undecided
    - D. No, it is not as good as most courses
    - E. Definitely no

13. How would you rate your instructor in general (all-around) teaching ability?
    - A. An outstanding and stimulating instructor
    - B. A very good instructor
    - C. A good instructor
    - D. An adequate, but not stimulating instructor
    - E. A poor and inadequate instructor

14. The following is a list of specific suggestions for the instructor or course. Circle the letter in front of as many or as few as you wish. Leave the others blank.

A. There should be better lights in the classroom
B. There should be better ventilation in the classroom
C. The classroom needs more blackboard space
D. The instructor should use more visual aids (charts, movies, models, etc.)
E. There should be more examinations
F. There should be fewer examinations
G. There should be less required outside reading
H. There should be more required outside reading
I. There should be less emphasis on memorizing in the examinations
J. The course should be covered better in the examinations
K. He should define the words he uses
L. Material should be presented more slowly
M. Less time should be spent in class discussion
N. Students should be encouraged to participate more in class discussions
O. The talkative students should be prevented from talking so much
P. The instructor should try to improve his appearance
Q. The objectives of the course should be explained more clearly
R. The course should include more material related to student experiences and problems
S. Work on the blackboard cannot be seen
T. The catalog description of the course should be re-written
U. The prerequisites for this course are not really necessary
V. The prerequisites for this course do not provide the necessary preparation
W. The course needs to be brought up to date
X. There should be more opportunity for answering questions in class
Y. I would like to get better acquainted with the instructor

COMMENT FREELY ON THE FOLLOWING QUESTIONS:

15. How well has this course met your needs, in terms of your personal and vocational goals? What might have been done to increase the worth of this course to you?

Should this overlap be reduced?

(CONTINUED ON NEXT PAGE)

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16. Has this instructor stimulated your curiosity about the subject matter of the course and made you want to learn more about the subject?

17. Does the instructor try to relate the material of this course with other areas of knowledge? Is this helpful?

18. If this course presents controversial matters: How tolerant is the instructor in receiving expressions of opinions differing from his own?

19. Does the instructor have any personal peculiarities or mannerisms or speech habits that lower the quality of instruction, and that he might be able to correct? If so, what?

20. How could the examinations in this course be improved?

21. Do you have any other suggestions to the instructor for improving this course, or the instruction in the course?

Do you object if we cut off this half of the booklet and give it to the instructor? .... ________

Or must we type a copy of it before giving it to him? .... ________

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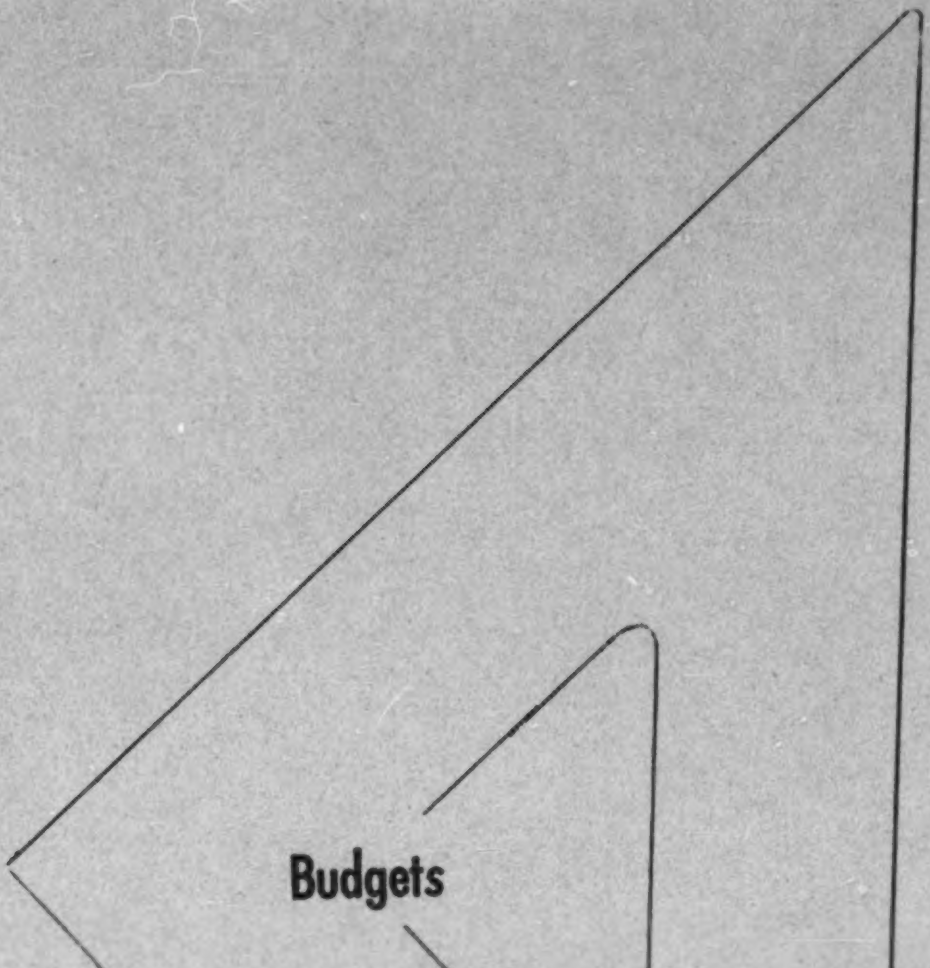

Budgets

IX. Budgetary Analysis

. . . . **John Dale Russell**

In this discussion we will concentrate on budgetary analysis; this is essentially a study of the relations of input and output. We will not discuss budgetary procedure, which is an important topic in itself, but rather the analysis of how institutional resources are used, as revealed in the expenditure budget.

By definition, a budget must be a "plan for institutional income and expenditure covering a definite fiscal period." Like any plan, a budget requires careful analysis in its preparation. It must cover both income and expenditure; it is always related to a specific time period, such as the fiscal year; and it should be complete and inclusive of all institutional operation.

Further, the budget is an expression, in dollars and cents, of institutional purposes and policies. It follows that any analysis of it must be based on an understanding of the purposes of the institution. Two features of budgetary analysis must always be kept in mind: (1) a budget analyst does not have authority to question the purposes of an institution; he does have responsibility for showing how these are reflected in the expenditure pattern; (2) the expenditure pattern, on analysis, may show different purposes, or a different emphasis on purposes, from those that are officially recognized, e.g., intercollegiate athletics, or research.

Expenditure analysis is a technique for obtaining, from raw financial data, information that will enable administrative officials to draw sound conclusions and make intelligent decisions regarding the operational status of an institution. It is useful: (1) at the time the budget for the coming year is being prepared; (2) during the course of the fiscal year, as revisions in the budget are requested; and (3) at the end of the budget year, as a check-up on results.

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[1] This lecture is a composite of (a) Dr. Russell's detailed lecture outlines, and (b) considerable material from the series of articles by Dr. Russell and Dr. James I. Doi on "Analysis of Institutional Expenditures." The latter is used by permission of College and University Business in which the articles appeared in 1955 and 1956.

Basic to all sound budgetary analysis is use of a good system for classification of expenditures. We are fortunate in higher education to have a good, standard system prepared originally by the National Committee on Standard Reports in 1935, and revised in the 1952 publication of the American Council on Education, entitled *College and University Business Administration, Volume I*.

Many institutions (perhaps most of them) unfortunately do not follow the standard system of classification precisely; therefore, inter-institutional comparisons of financial data must be made very cautiously.

For meaningful analysis of institutional expenditures, it is extremely important that accounting records classify all expenditures accurately and strictly, and in general accord with the standard pattern. The standard pattern sets up seven or eight distinct kinds of expenditures and outlays. These will be enumerated in this discussion, with some attention to desirable budgetary policies for each.

The standard major categories of expenditure and outlay items are as follows:

A. *Educational and general expenditures*.

These expenditures support the basic purposes for which an institution exists--teaching students and advancing knowledge. A characteristic of these expenditures is that they can appropriately be related to the number of students enrolled.

A general budgetary policy should be to support expenditures for educational and general purposes to the extent possible from unrestricted funds, and to encourage the largest possible number and amount of restricted gifts for purposes in this category. Further discussion of sub-classification within educational and general expenditures will be presented after noting the other kinds of current fund expenditures.

B. *Organized activities related to educational departments*.

Examples are a university press, operation of an agency for the construction and sale of psychological tests, operation of farms for instruction and demonstration in agriculture, operation of a laboratory school, operation of a home-demonstration house for students in home economics, and intercollegiate athletics.

Organized activities have two important characteristics:

1. They are fairly closely related to some educational department or purpose;
2. They produce some income for their own support.

The volume of these activities and the amount of their expenditure usually cannot be related to the number of students enrolled in an institution.

A policy usually followed in financing these activities is to try to make them self-supporting, but to subsidize them from general institutional funds to whatever extent is needed to make their operations successful. Each individual activity has to be analyzed separately to discover possible economies.

C. Auxiliary activities.

These are activities maintained for service to students and faculty; examples are residence halls, faculty housing, dining rooms, bookstores, student unions, and so forth. The volume of these activities normally cannot be related meaningfully to the total student enrollment of the institution. The most important characteristic of these activities is that they produce a direct income for their own support.

A recommended policy for financing auxiliary activities is that, as a group, they should be completely self-supporting, producing sufficient income to cover all direct expenditures, plus the estimated amount to cover indirect costs for plant operation and maintenance and for institutional administration, plus the costs of debt service, if the institution has incurred indebtedness for the construction of such facilities.

Auxiliary activities normally should not be expected to produce any net income beyond the full cost of their operation. When auxiliary activities are not self-supporting, budgetary analysis must be further pursued to determine the cause.

D. Non-educational expenditures.

These are expenditures that do not relate to the on-going program of an institution as an educational enterprise. Examples are scholarship grants, payments to annuitants (out of current funds), interest on indebtedness, and expenditures for fund-raising.

A sound financial policy is to hold expenditures in this category as nearly as possible to income that is restricted for these purposes. It must be remembered that expenditures for these purposes subtract from the support of the educational and general budget, if made from unrestricted funds.

E. Sponsored research.

This is now a large-scale activity in many institutions; in some, it has a higher dollar volume of operation than all other aspects of an institution combined. Sponsorship is largely by the

Federal Government, and also to some extent by industrial concerns. Endowed foundations often make "grants" to support research projects that are similar to sponsored research.

A common policy on financing sponsored research is to expect it to be completely self-supporting, and to pay its full share of institutional overhead. During analysis of these funds, two points should be taken note of: (1) the wide difference of practice among Federal agencies as to what constitutes fair payment for indirect costs; and (2) the temptation to divert funds, received as reimbursement for indirect costs, to specific purposes connected with a department that operates a research program.

F. Agency funds.

The characteristic of agency funds is that the institution does not own the assets, but merely holds and manages them for others. Examples are student deposits, research grants administered through members of an institution's staff, withholding tax collected but not yet remitted.

Agency funds sometimes provide a source of working capital for general current-fund operations. Since agency funds are "in and out" items, they have no effect on the net balance between income and expenditure. It is appropriate to charge a modest service fee (say 5 per cent) to cover the expenses of administering an agency fund account.

It is in the analysis of educational and general expenditures that the most important economies in institutional operations can be discovered. Subsequent discussion, therefore, will be limited to this category of expenditures.

The basic classification within "education and general expenditure" is according to function. Recognized functions under "education and general" are: (1) instruction (2) library (3) extension services (4) departmental research (or non-sponsored research) (5) administration (minus amounts charged off to other categories) and (6) plant operation and maintenance (also, minus amounts charged off to other categories).

A basic policy should be to put the maximum amount of expenditures for education and general purposes into the directly productive functions of instruction and library, and the least possible amounts, consistent with good service, into the "overhead" functions of administration and plant operation and maintenance. Further, there is need to keep a balance among the expenditures in the various functions.

Classification on the basis of function needs to be carefully distinguished from classification on the basis of object. When classifying according to function, one is asking "What function does the expenditure serve?" When classifying on the basis of "object," one is asking "What kind of a thing does the expenditure buy?" The object basis of classification is not a very useful means of analyzing total expenditures for education and general purposes.

Within each major functional category, expenditures can be subdivided as may seem useful for purposes of analysis. Sometimes an object basis is useful as a subdivision within a broad functional category.

Now, it has been emphasized that all financial analyses must be based on accounting records maintained in accordance with a sound system of classification and that expenditures be strictly allocated to proper categories. But no matter how well conceived the categories into which expenditures are classified, and no matter how carefully and accurately the financial accounting is done in accordance therewith, raw data on number of dollars expended requires further analysis and interpretation to be most meaningful. In fact, entirely erroneous conclusions may be drawn from raw data on expenditures unless they are accompanied by an appropriate analysis. As an example, Table 1 shows the expenditures in a state institution of higher education for each of the educational and general functions for 1951-52 and the budgeted amounts for the same functions for 1955-56.

Table 1
Expenditures for 1951-52 for Each Educational and General Function in a State Institution of Higher Education and Those Budgeted for 1955-56

Function	Actual Expenditures	Budgeted for 1955-56
Administration and general............	$ 377,606	$ 470,000
Instruction...........................	1,591,077	1,995,332
Organized research....................	47,877	51,833
Extension.............................	55,139	73,200
Libraries.............................	153,087	173,235
Plant operation and maintenance.......	446,830	508,000
Total for educational and general purposes............................	$2,671,616	$3,271,600

Table 1 shows the stage of financial analysis at which the first two requisites have been cared for. Total gross expenditures have been classified, first into that major grouping known as "educational and general" and then into recognized subcategories according to function. It may be presumed also that the second requisite, careful and accurate accounting, has been met. What do data such as those presented in Table 1 mean to a person not familiar with the innerworkings of the college or university? What would a member of the state legislature or the secretary of the state taxpayers association or any interested citizen conclude from the study of the figures in Table 1.

Probably the first observation would be that the institution is spending $600,000 more in 1955-56 than it did four years previously, for educational and general purposes. Increases in expenditures by a government agency are nearly always a cause for alarm among taxpaying citizens. A second observation from Table 1 is that expenditures for administration have increased more than $92,000, or almost 25 per cent, in the four-year period. Such an increase in "unproductive overhead" must be viewed very critically. Similarly, the increase of more than $60,000 for operation and maintenance of the physical plant would lead to a question as to whether this service is being conducted as efficiently as it formerly was.

An elected public official or a tax conscious citizen might draw the conclusion from a hasty examination of Table 1 that the institution is spending a lot of money unnecessarily--is, in fact, throwing money away like a drunken sailor. He might readily conclude that the tendency toward increases in expenditures should be checked when the next request for an appropriation is considered by the legislature and that further increases in appropriations should be denied. While such conclusions might be drawn honestly from Table 1, they might be very erroneous and harmful to an institution. Some further analysis is clearly needed to improve the interpretation of the data of Table 1.

Four basic techniques are used in the analysis of institutional expenditures, after totals of each category have been determined accurately.

A. The percentage distribution.

Within the category of educational and general expenditures, we find, as a general rule, the following percentage distribution among the various functions to be used as a guide, although deviations from it can be justified:

Administration, 15 per cent or less
Plant operation and maintenance, 16 per cent or less
Library, 5 to 6 per cent
Instruction, 60 per cent
The remaining 3 or 4 per cent for extension and research,
  depending on institutional purposes.

The method of percentage distribution can also be applied to the various objects or other subdivisions of expenditure within each function. The percentage distribution needs to be interpreted cautiously, for it is effected markedly by a number of factors, such as: (1) the size of the institution (2) the relative affluence of the institution's financing and (3) the emphasis placed in the institution on such matters as research, expensive plant facilities, etc.

B. The expenditure per unit of service.

The analysis of expenditure per unit of service involves three steps: (1) selection of expenditure category to be analyzed; (2) selection of appropriate and measurable unit of service; (this may oftentimes be the student) and (3) relation of expenditure to the measure of service.

This is sometimes known as the "unit cost" technique. The term "unit cost" has unfortunately come to have a bad connotation in higher education, and probably should be avoided. Further, one should avoid using the term "per capita cost" for this does not have the same meaning.

Perhaps the most valid criticism of the "unit cost" technique arises from the difficulty of identifying an appropriate unit of production or service. The unit most commonly used is the student in attendance for a year, or some recognized fraction of a year's service, such as the credit hour. Some services maintained by institutions, however, are not related directly to the number of students in attendance.

There are many legitimate uses of data on expenditure per unit of service, particularly in budgetary analyses in institutions of higher education. Costs are both an index of quality and an index of efficiency, and care must be taken in interpreting an observed cost to note which factor is positive.

Let's take a moment to discuss these two methods of analysis before we go on to the others.

As an illustration of how the use of these two methods throws additional interpretative light on the statistics of dollars expended, Table 2 is presented showing the expenditure data of Table 1 expressed as percentages of totals and as amounts per student.

The very simple analysis presented in Table 2 changes completely the interpretation that might have been drawn from Table 1. Table 2 shows that during the four-year period the changes in distribution of expenditures among the various functions have been slight. The biggest change in percentages has been in the direction of getting a larger proportion of total expenditures into the directly productive function of instruction. The institution is spending fewer dollars per student on almost every function in its 1955-56 budget than it did in 1951-52. The total educational and general expenditures, which seemed in Table 1 to have increased so greatly, are shown by Table 2 actually not to have kept pace with the increase in the number of students served. If the institution was financed on a reasonable basis in 1951-52, the conclusion from Table 2 must be that it needs more money, not less, than it has budgeted for 1955-56.

Table 2
Percentage of Total Educational and General Expenditures for Each Function, and Amount per Full-Time-Equivalent Student, in a State Institution of Higher Education for 1951-52, and Budgeted for 1955-56

Function	Percentage of Total Educational and General Expenditures		Amount per Full-Time-Equivalent Student	
	1951-52 Actual	1955-56 Budgeted	1951-52 Actual	1955-56 Budgeted
Administration and general	14.1	14.4	$117	$114
Instruction	59.6	61.0	494	485
Organized research	1.8	1.6	15	13
Extension	2.1	2.2	17	18
Libraries	5.7	5.3	47	42
Plant operation and maintenance	16.7	15.5	139	123
Total educational and general	100.0	100.0	$829	$795

Interpretation from the data on Table 2, however, is far from the final analysis. One immediately wants to ask what the experience of this institution has been in other years, or what the percentage distribution and amount per student are for other institutions in comparable years. To answer such questions requires information that is known as "normative data." A discussion of normative data will follow further discussion of other analysis techniques.

C. Program budget analysis.

This method proceeds from a conception of institutional activities as being classifiable into a number of separable "programs"; an attempt is made to determine the expenditure for each. Example of "programs" for which expenditure data might be sought are: (1) general education required of all students in the first two years; (2) the offering of a Bachelor's degree in French; (3) the offering of a Master's degree in English; (4) the student health service; (5) the counseling of students; (6) sabbatical leaves for faculty members; (7) unsponsored research; (8) correspondence study; (9) fund-raising activities.

Programs expenditure data may be usefully related to measures of service rendered. Program data are especially useful in forecasting effects of new developments on the budget.

D. Percentage of increase or decrease from some previous period.

This technique is useful only within a given institution, as a rule. The technique often has the great disadvantage of assuming that the base period is an ideal situation, or rather, failing to relate the base period to an ideal situation.

In general, this technique must be used very cautiously, for it is subject to manipulation by an unscrupulous investigator, who may be more interested in supporting a preconceived point of view than in finding the truth.

As mentioned above, normative data are needed for an adequate interpretation of any analysis made of institutional expenditures. In general, there are three types of normative data: (1) norms arbitrarily set up by some "authority." (An example is the suggested percentage distribution of expenditures among functions, as cited, above, under the discussion of the percentage distribution method of analysis;) (2) norms based on a time series within one institution, showing data from previous years; and (3) norms based on data from a sufficient number of similar institutions. (An example is the set of norms for expenditure per student, set up by the North Central Association.)

There are several requisites for accurate normative data:

(1) Data by expenditure classification under each of the major functional categories of educational and general expenditures should include such detail as is likely to be useful for administrative purposes.

(2) The collection of accurate and uniform data should be followed. Perhaps the greatest drawback that a college faces when it attempts to compare its financial data with those of other institutions is the lack of assurance that the information is truly comparable.

(3) Data should be recent. Few of the available compilations meet this criterion. Further, some sorts of data age more rapidly than others. In a period when the value of the dollar is changing, normative data may become obsolete quickly. While older data are valuable for historical purposes, most administrative decisions depend heavily on recent data. Norms should be renewed annually and should be released at a time when most useful for institutional administrative purposes.

(4) Institutions selected for inclusion in a group for which normative data are to be established should be comparable in as many respects as possible. Previous experience with attempts to compare expenditure data among institutions indicates that such factors as size of enrollments, location, general quality of instructional services, adequacy of support, and local institutional policies account for many of the differences.

Of course, there is a practical limit to the extent to which comparability of units comprising the normative group can be obtained. Every college is, in a real sense, unique--the only one of its kind. For highly complex social institutions, such as colleges and universities, it probably would be impractical to select more than three or four points of comparability in any exploratory project to derive normative data. The characteristics of each institution included in any population group should be kept in mind as possible explanations for deviations from the average in expenditure pattern or unit costs.

(5) Normative data should be based on a large enough group of institutions. If possible, the data should cover a period of consecutive years. What is a large enough number? The test is whether or not the addition of more institutions will change the norms. If a sample is well selected to represent an entire group or class, a surprisingly small number of individual institutions may yield a very stable norm.

The time span covered by normative data may properly differ in local circumstances. In general, a time series need not cover more than the last four or five years, unless some historical study is to be made. Carrying data for a longer time series is likely to clutter up tabular presentation and to complicate rather than to facilitate interpretation of the data for the most recent year. If it is desired to show the effect of a shift in policies, a time series should cover the period since that shift and a year or two prior to it. For most purposes the years during which policies have been stable will provide the most useful time series for normative purposes.

(6) Statistical data that are used as norms should have a) some expressions of the central tendency, such as the average or the median, and b) some measure of the extent of deviation from this central tendency by individual institutions.

Normative data of the North Central Association have been particularly useful because they have been set up in percentile form. This allows an institution at once to compare its own status with the central tendency (median) of the accredited group and also to interpret its deviation from the central tendency in terms of how far down or up it stands in the rank order list of these institutions. Thus, a college can tell that on a particular item it rates in the lowest 10 per cent of accredited institutions, or that on another item only 20 per cent of the accredited institutions have a higher standing. This sort of information is much more useful than merely to know that the college is below average or above average, even when the amount of the deviation from the average is known.

At present we do not have good sources of normative data on expenditures for higher education in the United States. Some of the available sources which are useful from time to time are: (1) the United States Office of Education; (2) certain accrediting associations, such as the North Central Association; (3) some of the central church boards of education; (4) a few states that have centralized supervisory boards over their institutions of higher education; and (5) publications of the National Federation of College and University Business Officers Associations.

ANALYSIS OF EXPENDITURES FOR ADMINISTRATIVE AND GENERAL PURPOSES

Administration and general expense is one of six principal subcategories under educational and general expenditures recommended in the 1935 report of the National Committee on Standard Reports for Institutions of Higher Education. Included under administration and general expense are the costs of all offices, units and activities that serve the entire institution; excluded are expenditures for the library and plant operation and maintenance.

Somewhat more specifically the broad function of administration and general expenses, as used in the accounting systems of the New Mexico state educational institutions, includes three major categories: (1) administration, (2) student welfare, and (3) general expenditures.

Included in the first category of "administration" are such subitems as the expenses of the board of regents, the president's office, the business office, the registrar's office, the information and public relations office, legal expense, auditing, administrative publications, administrative travel, and the retirement payments for administrative staff members.

Under "student welfare" are such functions and services as the dean of students office (or the dean of men and dean of women), counseling and testing service, student health service, placement service, and alumni office.

"General expenditures" consist of a number of items that cannot readily be allocated to other functions, such as dues and membership fees, commencement and diplomas, post office, telephone service, mimeographing and mailing, receptions and entertainment, and group life insurance. This last item, group insurance, might perhaps better have been distributed to the various functional areas in which the staff members serve, i.e. the amount on behalf of faculty members should be charged to instruction, that for members of the buildings and grounds staff should be charged to plant operation and maintenance, and that for administrative staff members to administration. Such a policy is followed in the accounting for retirement fund payments but has not been followed for group life insurance because the item is relatively small and the increased accuracy of accounting might not be worth the labor of distributing the amount involved to the various accounts.

The expenditures here analyzed for administration and general purposes should be the net amounts used for educational and general programs. In the case of each institution an appropriate amount for administrative overhead should be allocated to auxiliary enterprises and to organized activities related to instructional departments, and such allocations are subtracted from the gross expenditures for administration and general purposes.

The amounts of the allocations are determined individually by each institution on whatever basis seems appropriate. Similarly in those institutions which have contract-research programs and in which payments are received underthe contracts for indirect administrative costs, the amount of such receipts is subtracted from the gross institutional expenditures for administrative and general purposes.

The primary purposes of every institution of higher education are instruction and research. Administrators and administrative services exist to aid the faculty, those who do the actual research and teaching, to carry out their functions. This policy should be clearly reflected in the financial operations of an educational institution. A simple method of showing the relationship between instruction and administration is to compute the percentage distribution of total educational and general expenditures for each function. These figures are most useful when computed for a time series of several years. Table 1 shows what such data look like for a state institution of higher education for each year from 1951-52 to 1955-56.

For the current fiscal year, 1955-56, the institution shown in Table 3 has budgeted for instruction 61 cents of every dollar designated for educational and general purposes, and for administration and general purposes less than 15 cents out of every dollar. The data for previous fiscal years show that this relationship is not unusual; this institution has consistently maintained approximately a 4 to 1 ratio between expenditures for instruction and those for administration and general purposes. This kind of budgetary information is very reassuring to legislators, who sometimes entertain the suspicion that an increasingly large proportion of state appropriations is expended for high salaried administrative officers and similar "unproductive overhead." Legislators

Table 3

Expenditures for Educational and General Purposes in a State Institution of Higher Education for Each Year From 1951-52 to 1955-56, Analyzed in Terms of Percentage and Amount per Full-Time Equivalent Student for Each Function

	Expenditures for Educational and General Purposes						
Fiscal Year	Administration and General	Instruction	Organized Research	Extension	Library	Plant Operation and Maintenance	Totals
Amount*:							
1951-52	$377,606	$1,591,077	$47,877	$55,139	$153,087	$446,830	$2,671,616
1952-53	378,905	1,557,117	37,937	57,139	147,373	414,051	2,592,522
1953-54	409,216	1,668,441	45,255	56,426	149,901	401,365	2,730,604
1954-55	410,000	1,716,000	46,500	68,000	153,500	420,000	2,814,000
1955-56	470,000	1,995,332	51,833	73,200	173,235	508,000	3,271,600
Percentage:							
1951-52	14.1	59.6	1.8	2.1	5.7	16.7	100.0
1952-53	14.6	60.1	1.4	2.2	5.7	16.0	100.0
1953-54	15.0	61.1	1.7	2.0	5.5	14.7	100.0
1954-55	14.6	61.0	1.6	2.4	5.5	14.9	100.0
1955-56	14.4	61.0	1.6	2.2	5.3	15.5	100.0
Average:	14.5	60.6	1.6	2.2	5.5	15.6	100.0
Amount per student:							
1951-52	$ 117.16	$ 493.66	$ 14.86	$ 17.11	$ 47.50	$ 138.64	$ 828.93
1952-53	119.15	489.66	11.93	17.97	46.35	130.20	815.26
1953-54	124.42	507.28	13.76	17.15	45.58	122.03	830.22
1954-55	110.01	460.42	12.48	18.25	41.18	112.69	755.03
1955-56	114.22	484.89	12.60	17.79	42.10	123.45	795.05
Average:	116.99	487.18	13.13	17.66	44.54	125.40	804.90

*Amounts for first three years are actual audited figures. Amounts for 1954-55 are estimates reported approximately two months before the close of the fiscal year. Amounts for 1955-56 are the budgeted expenditures.

and supporters of an institution also are interested in knowing what the relationship is between expenditure for a given function and the number of students served. Is the expenditure per student for administration rising? If so, how much? Such a question can best be answered by an analysis of expenditures for educational and general purposes showing amounts per full-time equivalent student for each function as presented in Table 3.

Table 3 shows that the amount per student budgeted for 1955-56 for administration and general, and for virtually every other function, is lower than the comparable expenditure for any other fiscal year of the five-year period, except 1954-55. The officials of the institution should have no difficulty explaining the drop in expenditures per student for 1954-55. In that year there was an unexpected increase of 13.3 per cent in enrollment. The appropriation already had been fixed by the legislature, so the institution had to make the best of the situation with the funds it had available for that year. The problem was presented to the next state legislature, and it provided a 22 per cent increase in appropriation for this institution. The effect of this increased appropriation on institutional operations is reflected in the amount per student budgeted for 1955-56 for educational and general purposes, as shown in Table 3.

The experience in New Mexico has been that members of legislative finance committees generally have a keen appreciation for compactly presented data on expenditures and costs. They may listen with apparent sympathy to a president's oration about the needs of his institution, in which he emphasizes the difficulties of employing and retaining competent faculty members and the pressure of increasing enrollments. But they seem to show a decided preference for unit cost figures, such as expenditure per student for educational and general purposes. When properly computed and interpreted, such data can sum up a good many arguments in a neat little package.

Institutional officials should support their petitions for more appropriations with such information. Otherwise they are likely to find themselves confronted by a request to comment on some analytical data claimed by a legislator to have been computed by him from the financial records of the institution or by some budget analyst who is not particularly well versed regarding college and university finance.

The institutional official in such a situation faces a double jeopardy. In the first place, it is always embarrassing to have to explain figures with which one is unfamiliar. In the second place, such data often will have been amateurishly calculated or otherwise do not properly reflect the educational program of the institution. An incorrect interpretation, once it is publicized, is difficult to correct. And if the effort is made to correct it, the legislator may be antagonized by what seems to him an attempt to discredit his figures.

The presentation of budget analysis data for one college or university generally invites comparison with similar information for other institutions. Is it unusual that only 15 cents out of every dollar designated for educational purposes is budgeted for administration and general expense? Are other institutions able to do on fewer dollars per student, or do they usually spend more? To provide answers to such questions on a truly comparable basis is one of the hazards of dealing with budget analysis data.

Worse still is the necessity of explaining why some other institution can operate with lower unit costs or can budget a greater proportion of its educational and general expenditures for instruction and less for administration. Low unit cost figures may indicate either great efficiency or poor quality of service; conversely, high cost figures may reflect either comparative inefficiency or an excellent quality of service. And again differences in expenditure pattern or cost per student might be due to factors, such as difference in accounting practice, totally unrelated to the question of efficiency or quality.

There is only one satisfactory solution to this problem. Normative data of the kind that will enable one institution to compare its expenditures with those of another must be collected and be made available.

In order to answer questions calling for comparison of expenditure data among institutions, the New Mexico Board of Educational Finance, since it began operations in 1952, has made an annual analysis of the budgets of the New Mexico state colleges and universities. Table 4 shows the percentage distribution of educational and general expenditures for each function and the amount per student expended by each of the six New Mexico state institutions of higher education for 1954-55, the last completed fiscal year.

It will be noted from Table 4 that the percentage distribution for the total of the six institutions for 1954-55 differs little from the average for the five-year period. One of the interesting observations from this attempt to collect and present normative data is the stability of the percentage distribution of expenditures among the various functions. The figures change little from year to year, either for the individual institutions or for their combined average.

Although the percentage distribution for an institution is very stable from one year to the next, Table 4 shows that, among the institutions, the percentages of total educational and general expenditures devoted for administration and general expense vary considerably. It is clear from the table that at least two of the institutions have some explaining to do if they are to justify the relatively high proportion of their total expenditures used for administration and general purposes.

Previous studies dealing with data for institutions of higher education have established that any one of the following factors may

Table 4
Percentage Distribution of Total Educational and General Expenditures for Each Function for Each of Six State Institutions of Higher Education for 1954-55, and Average for All Six Institutions Combined for Five-Year Period, Including Budget for 1955-56

Institution	Full-Time Equivalent Enrollment	Adminis- tration & General	Instruction	Organized Research	Extension	Libraries	Plant Opera- tion and Maintenance
"A"	3,727	14.6	61.0	1.6	2.4	5.5	14.9
"B"	1,702	14.6	61.8	0.2	0.0	5.3	18.1
"C"	925	14.0	60.1	---	0.3	4.9	20.7
"D"	464	21.8	50.4	---	3.0	5.1	19.7
"E"	967	22.2	54.4	---	2.7	5.7	15.0
"F"	174	15.9	48.4	---	---	4.3	31.4
Weighted average for 1954-55		15.9	59.0	0.8	1.7	5.3	17.3
Five-year average for all institutions combined		15.7	58.9	0.8	1.6	5.3	17.7

result in variation in figures showing percentage of total spent for administration and general: (1) differences in accounting practice; (2) degree of adequacy of support; (3) size of enrollments, and (4) differences in institutional policies with respect to salaries and elaborateness of the administrative staff.

For the six New Mexico institutions the first two factors can be ruled out as having no significant effect on the percentage of total educational expenditures spent for administrative and general purposes. With respect to both classification and handling of expenditure data and adequacy of support, this group of institutions has about as high a degree of comparability and similarity as could be found.

Size makes a Difference

Examination of the enrollment data strongly suggests that size of the institution could account for some of the difference in the percentage figures showing proportion of total educational expenditures spent for administration and general. The larger institutions tend to assign a smaller part of their total educational expenditures for this function. There are, however, two notable exceptions.

Institution "E," which ranks third in enrollment, devotes the largest proportion of its educational expenditures to administration and general functions. Examination of the administrative organization of this college shows that it is top-heavy and over-elaborate. The same organization could adequately serve an institution with at least 50 per cent more students. Institution "F," the smallest from the standpoint of enrollment, spent only 15.9 per cent of its total educational and general expenditures for administration and general purposes. This insitution, in addition to its instructional program, maintains an extensive contract-research program. A large proportion of its total administration and general expense is charged off as overhead to the contract-research program.

Table 5 shows the amount expended per student for each of the functions under educational and general expenditures. The table shows the amounts for each of the six institutions for the last completed fiscal year, 1954-55, and also the combined average for all six institutions for a five-year period, beginning with 1951-52 and running through the budgeted amounts for 1955-56.

As previously explained, 1954-55 was a low year for expenditure per student because of the general increase that occurred in enrollments that year without there being any corresponding increase in budgetary support. The five-year average is thus substantially above the amounts for 1954-55 for each of the functions. There also has been some effort put into increased efficiency so that the institutions are serving more students without correspondingly increased appropriations.

Table 5

Expenditure per Student for Each Educational and General Function for Six State Institutions of Higher Education for 1954-55, and Average for All Institutions Combined for Five-Year Period, Including Budget for 1955-56

Institution	Full-Time Equivalent Enrollment	Adminis-tration & General	Instruction	Organized Research	Extension	Libraries	Plant Opera-tion & Maintenance	Total Expenditure per Student
"A"	3,727	$110.01	$460.42	$12.48	$18.25	$41.18	$112.69	$755.03
"B"	1,702	100.70	428.19	1.06	0.18	36.80	125.48	692.41
"C"	925	97.60	417.47	---	2.42	33.73	143.78	695.00
"D"	464	195.00	450.04	---	26.79	45.56	175.63	893.02
"E"	967	136.28	334.28	---	16.55	35.16	92.00	614.27
"F"	174	268.53	814.66	---	---	71.53	529.17	1,683.89
Weighted average for 1954-55		$118.18	$440.35	$ 6.07	$12.44	$39.57	$129.30	$745.91
Five-year average for all institutions combined		$128.23	$481.80	$ 6.79	$12.91	$43.28	$144.99	$818.00

Table 5 shows that the amounts per student expended for administration and general purposes, like the percentage figures, vary rather widely.

The variations shown in Table 5 call for some explanation and justification. The figures for institution "E" in particular suggest that it could well afford to reduce its administrative expenditures and devote more of its funds to the instructional program.

The data show that the larger institutions tend to spend less per student for the administration and general function than the smaller ones spend. Both the figures for percentage of total educational expenditures used for administration and general and the amount per student expended for this function point to what has been known to students of higher education for some time, namely, that institutions with enrollments of approximately a thousand or less are in many respects inherently less efficient than institutions with larger enrollments. Certain administrative functions, such as meetings of the governing board and the office of the president, have to be performed regardless of the size of the institution, and their expenditures do not correspond in scope to the number of students enrolled.

The experience in New Mexico has been that, once this fact is explained to legislators and to state finance officers, they no longer get greatly excited over variations in data showing expenditures per student for educational and general purposes. They tend, rather, to show greater interest in promoting enrollment increases in the smaller institutions, hoping that registrations may reach a point where more economical operation can be expected. When the analysis indicates that factors other than enrollment, such as top-heavy administration, are the probable causes of high unit costs, officials of the institutions need to be urged to take steps to correct the situation as quickly as possible.

New Mexico institutions, by agreement among the business managers, classify their administration and general expense into three subdivisions: "administration," "student welfare services," and "general expense." With but minor exceptions the items included in each of the subdivisions are identical with those suggested for "general administration," "student welfare," and "general institutional expense" in the 1952 committee report.

Table 6 shows the percentages of total educational and general expenditures for "administration," for "student welfare," and for "general expense," and the amounts per student for each function for 1954-55 at each of six New Mexico institutions. These data point up certain interesting variations among institutions that the percentage figures on distribution of expenditures for educational and general purposes did not bring out.

Before any conclusions are reached about adequacy and relative efficiency of student welfare services among these three institutions,

Table 6
Percentage of Total Educational and General Expenditures for Administration, Student Welfare, and General Expense, and Amount per Student for Each Subdivision for 1954-55 for Six State Institutions of Higher Education.

Institution	ADMINISTRATION		STUDENT WELFARE		GENERAL EXPENSE	
	Percentage	Amount per Student	Percentage	Amount per Student	Percentage	Amount per Student
"A"	6.7	$ 50.77	5.2	$39.29	2.7	$19.95
"B"	10.4	72.00	2.7	18.34	1.5	10.36
"C"	10.2	71.21	1.6	10.87	2.2	15.52
"D"	12.2	109.02	5.8	51.57	3.8	34.41
"E"	12.6	77.25	7.2	44.27	2.4	14.76
"F"	11.5	193.34	2.2	36.91	2.2	38.28
Weighted Average	9.1	$ 67.41	4.4	$32.77	2.4	$18.00

further examination of their budgets should be made. Institutions "B" and "C," it was found, classify their student health services as an auxiliary enterprise and did not include them in their reports on expenditures for student welfare services. This is an inconsistency that should be corrected. The other four institutions, including "A," classified their student health services as a part of their student welfare program. This difference in accounting practice explains in large part the unusually low expenditure per student for student welfare services at institutions "B" and "C."

The data shown in Table 6 suggest that at institution "E," which earlier had been referred to as an institution with an overly elaborate administrative organization, the areas that are out of line are its administrative offices and its student welfare services. Its "general expense" is at a reasonable level.

The items included under each subdivision of administration and general expense are subject to much more detailed kinds of analyses. The data produced from such analyses can be of great value to institutional officials. For the New Mexico institutions the Board of Educational Finance regularly provides comparative data on salaries for individual administrative positions. Data also are provided on expenditures for a number of administrative and general services, such as public relations and information, administrative publications, auditing and so forth.

There has been virtually no research reported on the standards for the number of secretaries and clerical workers a college or a university should employ. In four New Mexico institutions, the ratios of number of students to each person on the clerical staff have a high degree of similarity.

The New Mexico data suggest that reliable norms might be developed on student-clerical employee ratios for institutions of different sizes. Such information would greatly assist administrative officials of higher educational institutions in detecting inefficiencies in an area to which a large proportion of total expenditures for administrative and general functions is committed. On the average, the six New Mexico institutions during 1954-55 devoted to salaries of secretarial and clerical personnel employed in the administrative offices more than 5 per cent of their total expenditures for educational and general purposes.

The average salaries paid the clerical worker in the administrative offices are greatly influenced by the supply and demand for such talent in the area in which an institution is located. Institutions located in the vicinity of federal installations, such as air force bases and weapons research centers, find themselves having to compete with federal government wage scales in order to retain their clerical personnel. The average clerical salaries at these institutions are several hundred dollars higher than similar averages for institutions located in agricultural, non-industrial areas. The geographical location of an institution of higher education is therefore a factor to be considered in explaining variations in expenditure data for administrative and general purposes.

ANALYSIS OF LIBRARY EXPENDITURES

The college librarian, on most campuses, is a well trained, devoted practitioner of what he, his colleagues, and the academic world generally think of as a profession. The librarian typically will have had more professional preparation for this position than any other member of the college or university administrative staff. Not only does his training give him a firm grasp of the technical processes of library operations, such as maintaining accession lists, purchasing books, classifying and cataloging documents, answering reference questions, and overseeing the circulation of library materials, but, if he has had the full professional curriculum, he is well prepared to be a college administrator.

The competent librarian is expected to have an understanding of the basic principles of administrative organization, personnel management, public relations, and budgeting. In the librarian's professional journals economy and efficiency of operations is a subject of frequent discussion. And in his efforts to stretch the dollar so as to provide the maximum of services, the librarian and his colleagues often have concerned themselves with intricate cost studies.

The familiarity of the competent, professionally trained college librarian with budgeting and finance is unquestionably a blessing to the administration of an institution. This familiarity of the librarian with budgetary and financial technics can, however, put the president and the business officer of the institution on the defensive when proposed operating budgets are being considered. The librarian can be expected to use his knowledge of library finance to obtain the largest possible support for his unit. The president and business manager must therefore also be familiar with the commoner methods of analyzing library expenditures, in order that the soundness of the librarian's well-supported requests may be accurately appraised.

"Libraries" is one of six principal categories under educational and general expenditures. Under this category, the total direct expenditures of the institution for library services should be reported--salaries, purchase of books and other reading and research materials, binding, and all other library expenses such as supplies, printing and transportation, but excluding capital outlay.

Percentage Figure Good Index

The two basic methods of analyzing expenditures described earlier are frequently applied to the library. These two methods yield figures showing the percentage of total educational and general expenditures devoted to libraries and the amount per student used for this function. The percentage figure reflects the adequacy of support for library services compared to the support given other educational and general functions such as administration, instruction, and plant operation and maintenance. It is an index of the relative value that an institution places upon its library service. Librarians are extremely sensitive to fluctuations in this figure and are quick to express alarm when it begins to decline from a previous level.

Data showing expenditure per student for library services are frequently used as a basis for making comparisons among institutions. Any large deviation from the average for institutions that are comparable, with respect to size of student body and level and type of instructional program, should ordinarily prompt institutional officials into a search for explanations. Even when data for comparable institutions are unavailable, an institution will find it useful to compute the amounts expended per student for library services for a series of several years.

Table 7
Percentage of Total Educational and General Expenditures for Libraries and Amount per Student Expended for This Function for Six State Institutions of Higher Education

		Percentage of Total Educational & General Expenditures for Libraries		Expenditure per Full-Time-Equivalent Student for Libraries	
Institution	Enrollment 1954-55	1954-55	Five-Year Average	1954-55	Five-Year Average
"A"	3,727	5.5	5.5	$41.18	$44.32
"B"	1,702	5.3	5.3	36.80	41.36
"C"	925	4.9	4.3	33.73	32.93
"D"	464	5.1	5.4	45.56	53.41
"E"	967	5.7	5.4	35.16	39.79
"F"	174	4.3	4.7	71.53	79.44
Average for all institutions combined		5.3	5.3	$39.57	$43.28

Table 7 shows the percentage of total educational and general expenditures spent for libraries and the amount per student for this function for six state institutions of higher education. The data shown are for the last completed fiscal year 1954-55 and the averages for the five-year period beginning with 1951-52 and including the budgeted funds for 1955-56.

Comparison of the percentage figures for 1954-55 with the five-year averages indicates that the institutions maintain a remarkably uniform policy of library support from year to year.

The expenditure per full-time-equivalent student for libraries also shows a fair degree of stability. In 1951-52 the average for the six institutions was $42.81; in 1952-53, $46.24; in 1953-54, $45.11, and in 1954-55, $39.57. Library expenditures budgeted by the six institutions for 1955-56 provide for an average of $43.37 per student, which comes close to the combined five-year average of $43.28. The expenditure per student for 1954-55 was less than the individual five-year average at every institution but one.

The two institutions with the smallest enrollments, "D" and "F," have the highest expenditure per student for library services. The library services at these two institutions are neither more adequately supported than at the others nor of better quality. The comparatively high expenditure per student reflects the inherent inefficiency of institutions with small enrollments. It has been demonstrated in several studies that a small institution, in order to maintain an adequate library service, has to have almost as large a budget for such items as books and periodicals as an institution with a much bigger enrollment.

Data on expenditure per student for library services have somewhat less stability from year to year than the percentage figures showing distribution of expenditures for various educational and general functions. For that reason unit cost data for library services, if used for inter-institutional comparisons, should be for the latest possible fiscal year. The most readily available source of recent data on library expenditure per student is the journal, College and Research Libraries. This quarterly publication annually compiles and publishes library statistics for the last completed fiscal year for a group of approximately 275 institutions.

Another source of up-to-date information on library expenditures is the "Statistics for College and University Libraries," issued annually by the Princeton University Library. This report includes data only for a selected group of large university and college libraries, and is of limited value to small institutions for purposes of comparison.

Data showing the proportion of total educational and general expenditures devoted to libraries and the amount per student expended for this purpose give only a general picture of library finances. If the administrator finds that his institution devotes either a larger or a smaller percentage of its total educational and general expenditures to library service than other institutions on the average, or that the amount expended per student for this function differs from the average, these facts do not pin-point the spots where correction may be needed. A more detailed analysis of library expenditures is necessary to suggest a proper course of administrative action.

Table 8 shows the amounts and percentage of total library expenditures devoted to four object items--salaries, books and periodicals, binding, and other library expenses--in six state institutions of higher education for 1954-55. Expenditures per student for each of the four budget items also are shown.

Considerable research has been done on the percentage relationship of the amounts budgeted for the various objects of library expenditures. It is generally accepted among librarians that a properly organized library budget designates from 55 to 65 per cent of its total for salaries, from 30 to 35 per cent for books, periodicals and binding, and from 5 to 10 per cent for other library expenses. These figures are by no means hard and fast, and slightly different distribution patterns are given by some writers on library administration.

Waples, in 1936, studied the relationship between various kinds of per student expenditure data and excellence of library service. He found that the amount expended per student for library salaries, if it is to be used as a reliable criterion of excellence of library service, should be weighted for enrollment. In other words, a college with a small enrollment should spend more per student for library salaries in order to maintain a quality of service comparable to that of institutions with larger enrollment.

The North Central Association of Colleges and Secondary Schools has since used the amount expended per student for library salaries, weighted for enrollment, as one criterion of quality of library service. Waples also established that the average annual expenditure for books and periodicals for a five-year period was a more reliable index of quality of library service than the amount expended per student for this budget item. Prior to Waples' study, the North Central Association had urged institutions to spend at least $5 per student annually for books and periodicals. This standard was abandoned following his finding.

The experience in New Mexico has been that when an institution is hard-pressed for funds, the library budget for purchase of books and for binding tends to be among the first items to suffer reduction. Such cuts, however, seldom seem to result in any permanent saving. An institution with a reasonably efficiently operated library will have to make up the postponed book purchases within a relatively short time if the quality of its services is not to suffer damage.

Another important factor in analyzing the staffing of the library is the distribution of personnel and salary payments among the various employee categories.

Table 8
Analysis of Library Expenditures, by Object, for 1954-55 for Six State Institutions of Higher Education

Expenditure Item	Institution A	B	C	D	E	F	Average for 1954-55	Five-year Average for All Institutions Combined
Percentage of Total Library Expenditures for:	%	%	%	%	%	%	%	%
Salaries	61.5	63.0	60.6	51.4	66.0	44.4	60.9	61.0
Books and periodicals	26.8	27.1	25.6	33.1	19.3	42.5	27.0	26.8
Binding	5.9	4.8	7.2	3.1	8.8	10.6	6.1	5.4
Other library expenses	5.8	5.1	6.6	12.4	5.9	2.5	6.0	6.8
Library Expenditure per Student for:								
Salaries	$25.34	$23.17	$20.43	$23.44	$23.22	$31.74	$24.08	$26.40
Books and periodicals	11.03	9.99	8.65	15.09	6.77	30.40	10.67	11.61
Binding	2.44	1.76	2.41	1.40	3.10	7.60	2.42	2.34
Other library expenses	2.37	1.88	2.24	5.63	2.07	1.79	2.39	2.93

In six New Mexico institutions, in 1955-56, 66.4 per cent of library salary expenditures were for professional staff, 18.3 per cent for nonprofessional staff, and 15.3 per cent for student help.

There is considerable variation in institutional policies regarding the extent of reliance on student help. The use of student help in libraries is a common practice among collegiate institutions, and can be justified for a number of good reasons. Many students have pressing need for the funds they earn in order to stay in college. Working in the library also can contribute to the education of the student. The value of a student's service in a library depends greatly upon the degree and expertness of supervision exercised by members of the professional staff.

The data on ratio of professional library staff members to nonprofessional employees show a wide variation among these six institutions. The average for the six institutions is about 1.50 professional employees to each nonprofessional. This average approximates the medians for several groups of collegiate institutions reported for 1953-54 by the College and Research Libraries.

McNeal recently questioned the existing ratios of professional to nonprofessional employees in college and university libraries as an uneconomical use of professional talent. He suggests that one professional staff member should be able to direct the activities of two nonprofessional employees. We are inclined to agree with this suggested standard for library staffing.

A ratio of two or more professional librarians to one nonprofessional employee would seem to indicate that professional staff members are spending too much of their energy and time doing work of clerical or semi-clerical nature. Inasmuch as average salaries for professional staff members are more than twice those for nonprofessional employees, the suggestion of a low ratio of professional to nonprofessional employees is certainly in the interest of economy. Such a policy should enable an institution to employ fewer but more highly qualified staff members for those library operations that require well prepared professional personnel.

The American Library Association has done considerable research on the problem of library staffing needs and has developed an interesting formula to guide collegiate institutions in determing the number of professional staff members that should be employed. This formula takes into account (1) the level of instructional program maintained by an institution and (2) the differential demands for library service by faculty members, graduate students, honor students, upper-class undergraduate students, and lower-class undergraduate students. Each lower-class undergraduate student, for example, is given a weighting of one service unit and each faculty member a weighting of five service units. Unfortunately the evidence for the validation of these weightings and standards is not presented.

PLANT OPERATION AND MAINTENANCE

We shall limit our discussion to the kinds of analysis of expenditure data that, in our experience, have been useful in giving legislators and supporters of an institution an understanding of the problems of plant operation and maintenance. The particular focus is on the kinds of analyses that may be made of expenditures that will be helpful in interpreting budget requests and in suggesting to institutional officials areas of plant operation activities in which economies might be effected.

We are far from satisfied with the limited kinds of data that are generally used for relating needs and efficiency of plant operation activities to budgetary requests.

In the 1935 report of the National Committee on Standard Reports for Institutions of Higher Education and in the 1952 report of the National Committee on the Preparation of a Manual on College and University Business Administration, plant operation and maintenance costs are classified as expenditures for educational and general purposes. Subdivisions suggested for inclusion under this category are: administration (or supervision); janitorial service; repair of buildings; repair of furniture and equipment; care and maintenance of grounds; heat, light, water, power and gas; police and watchmen; property insurance; general trucking, and rent of property for institutional purposes. The reports of both the national committess recommend that expenditures for plant operation and maintenance incurred by auxiliary enterprises and other units not directly related to the educational program of the institution be excluded from the amounts reported under educational and general.

The function of a buildings and grounds department is to operate and maintain the physical stage on which the instructional and research activities of a college or university take place. The department is a service unit existing for the convenience and benefit of faculty and students. These services are essential and, when carried out efficiently and unobtrusively, add greatly to the effectiveness of an institution. However, it must be recognized that a smoothly functioning department of buildings and grounds is not always adequately appreciated by students, faculty members, or academic administrative officers. Budgetwise the expenditures for plant operation and maintenance constitute an unavoidable overhead, a deduction from the funds available for such direct instructional purposes as faculty salaries, classroom and laboratory supplies, and library. For that reason, expenditures for plant operation and maintenance should claim as small a portion as possible of the total amount spent or budgeted for educational and general purposes, consistent with effective service.

The Board of Educational Finance, as a central budgetary coordinating agency, first began to exercise some influence over the patterns of expenditure in the New Mexico educational institutions in 1952. Since

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that time the proposed budgets for plant operation and maintenance have been scrutinized critically, in the interest of stretching the budget dollar so as to leave the largest possible amount of income for the support of strictly educational services. The board has suggested to the institutions that the expenditures for plant operation and maintenance should, as nearly as possible, be kept within the limit of 15 per cent of the total educational and general expenditures. Budget estimates that exceed this percentage are examined in considerable detail and must be thoroughly justified.

There is evidence that the 15 per cent limit is perhaps a bit low. Only two of the six institutions have been able consistently during the period to stay reasonably close to this limit. Three of the institutions have always been considerably above the limit, one of them spending more than twice the suggested percentage every year for plant operation and maintenance. The board still adheres to its 15 per cent rule but treats this limit with reasonable flexibility, only insisting that deviations be thoroughly justified.

Before attempting to delve more deeply into the expenditure data, we might review the major factors that contribute to high plant operation and maintenance costs. According to the many plant officials and others who have studied this problem, the following factors can be listed:

1. Neglect of maintenance factor in planning new buildings. An institution, in an effort to economize or through sheer ignorance, sometimes leaves out building features which over a period of years more than pay for their initial outlay by cheaper operation and maintenance expense.

2. Continued use of a building after it has outlived its usefulness and becomes expensive to operate and maintain.

3. Overexpanded plant facilities. An institution should make optimum use of its existing plant facilities. Too frequently an institution will engage in a plant expansion program, when a study of space utilization would show that it could accommodate a much larger enrollment within its existing facilities.

4. Poor plant staffing practice. This usually takes two forms: overstaffing and employment of poor quality personnel. Overstaffing is particularly likely to occur in the janitorial crew. The employment of poor-grade personnel is particularly uneconomical in supervisory and technical posts. Use of student labor may result in an inordinately high cost.

5. Failure to mechanize. With the high cost of labor, no institution can these days afford to overlook mechanization as a means for reducing man-hours of labor in plant operation and maintenance activities.

6. *Uneconomical purchasing practices.*

7. *Tolerance of outmoded or badly worn maintenance equipment and utility facilities.* Institutions oftentimes wait too long to replace worn-out, leaky steam lines, boilers and equipment that are in need of constant repairs.

8. *Lack of a preventive maintenance program.* This appears to be a favorite topic of conversation among plant engineers, and justly so. Preventive maintenance is good administration. Lack of a preventive maintenance program generally results in a backlog of delayed maintenance.

9. *Misclassification of capital outlay as plant maintenance.* Sometimes plant improvement and betterment projects are carried on by the regular maintenance staff of the college or university. The expenditures for such projects, unless special care is taken in the financial accounting, are made from the ordinary budget for repairs and maintenance. The cost of plant operation and maintenance in the report of expenditures for current educational and general purposes is incorrectly inflated when it includes outlays for such purposes as the construction of small buildings (not involving any replacement) or for permanent improvements to the campus grounds.

10. *An uncooperative faculty and student body.* Conclusions as to the extent to which an uncooperative attitude of students and faculty members contribute to a high cost of plant operation and maintenance will depend on one's point of view. Faculty members and students probably look on the problem differently from the superintendent of buildings and grounds. Many plant officials consider this an important item in the list of factors affecting the cost of plant operation and maintenance.

11. *Institutional policy of maintaining a show place.* While every college should have an attractive campus, occasionally one finds an institution that appears to be maintaining a show place of ivy covered walls, arbored walks, acres of lawn and flowers, and monumental buildings. A campus beautiful undoubtedly has its merits, such as enticing students to enroll, but its maintenance cost may make serious inroads on the institution's faculty salary budget.

Some Conditions Unavoidable

With good administration an institution can avoid or correct every one of these 11 situations that contribute to high costs of plant operation and maintenance. There are other conditions, however, which an institution cannot avoid and must live with. These have to do chiefly with the geographical location of an institution.

An institution located in a northern state cannot avoid relatively high expenditures for heat and light, in comparison to its counterpart in a southern state. An institution located in a large metropolitan community, particularly in or near a slum area, will probably have to expend a rather large amount for police and watchmen service, but a college located in a small rural community would probably have small need for campus police protection. An institution situated in a large industrial city or near an important installation of the federal government may have to pay considerably higher wages, in comparison to its counterpart in a rural community, to employ and maintain its buildings and grounds crew. No amount of good administration can change these particular conditions.

Situations such as the foregoing must be clearly kept in mind in the course of expenditure analysis.

A simple method of analyzing expenditures for plant operation and maintenance is to list the amounts for each object under this category for a series of several consecutive years. Table 9 shows how this might be done.

Data reflecting the object classification of expenditures may be useful when analyzed in terms of the percentage that expenditure for each object item is of the total plant operation and maintenance costs. The data resulting from this procedure are shown in Table 9.

The figures in this table give a quick picture of the phases of plant operation and maintenance that are the most costly. For this group of six institutions, three items, utilities, repair of buildings and equipment, and janitorial service, consume on the average approximately 70 per cent of the total plant operation and maintenance budget. The report of the "Sixty College Study" also indicates that these three items constitute the major portion of expenditures for this particular purpose.

An institution interested in economy and efficiency in plant operations should reap the most benefit by a careful study of these three activities. Also when rather large differences in expenditure patterns are noted, such as the high percentage of total plant operation and maintenance budget committed for insurance at institution "B," a search for explanations should be undertaken by the administrative officials.

At institution "B" the item principally responsible for the large increase in percentage of total educational and general expenditures devoted to plant operation and maintenance is clearly shown to be repairs of buildings and equipment. The budget for this purpose for 1955-56 is almost three times as large as the actual expenditures for the previous year. For many years this institution had delayed repairs and maintenance because of a shortage of funds. The day of reckoning had to come sooner or later.

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Table 9
Percentage of Total Expenditures for Plant Operation and Maintenance for Each Object

Object	Year	Institution						
		A	B	C	D	E	F	Average
Administrative or supervisory office	1954-55	6.7	8.8	7.7	4.9	4.8	5.3	6.9
	1955-56	7.0	8.1	8.6	4.9	3.8	5.4	6.9
Janitorial service	1954-55	17.6	12.5	18.9	19.8	34.7	9.1	17.2
	1955-56	15.7	9.7	19.1	18.6	30.4	9.3	15.4
Maintenance of grounds	1954-55	8.7	8.2	9.8	13.0	8.1	8.0	8.9
	1955-56	9.0	8.5	11.5	13.2	7.5	10.6	9.4
Repairs of buildings and equipment	1954-55	33.9	16.5	10.8	9.0	17.9	11.6	22.0
	1955-56	34.6	30.7	11.0	17.1	30.4	10.1	27.5
Heat, light, water, power, and gas	1954-55	22.7	36.9	38.5	33.0	23.6	49.0	31.3
	1955-56	23.6	29.4	35.0	26.6	19.0	47.4	28.1
Police and watchmen	1954-55	3.9	0.2	4.2	2.0	1.3	2.1	2.6
	1955-56	3.5	0.5	3.8	1.5	1.4	2.2	2.3
Autos and truck expense	1954-55	3.7	1.6	2.1	3.8	1.7	7.3	3.2
	1955-56	3.3	1.2	2.6	5.4	1.5	6.7	3.0
Insurance of plant and equipment	1954-55	2.4	14.0	6.5	12.3	7.9	5.1	6.9
	1955-56	2.5	11.0	7.0	9.2	5.5	4.7	6.1
Other expenditures	1954-55	0.4	1.3	1.5	2.2	-	2.5	1.0
	1955-56	0.8	0.9	1.4	3.5	0.5	3.6	1.3

Another method of analyzing expenditures for plant operation and maintenance is to compute unit costs, such as amount per student, or per square foot of floor area, or per cubic foot of plant space. The choice of the unit depends upon what one is trying to discover or demonstrate.

The significance of figures for cost per student in the analysis of expenditures for plant operation and maintenance rests on the principle that the size of the physical plant should be related to the size of student enrollment. The unusually high expenditure per student for plant operation and maintenance at institution "F," year after year, indicates that it may have more instructional space than necessary for the size of the student body. (See Table 10.)

Table 10
Amount per Student Expended for Plant Operation and Maintenance for Six State Institutions of Higher Education

	Institution						Six Institutions Combined
	A	B	C	D	E	F	
1951-52	$139	$107	$125	$247	$101	$552	$145
1952-53	130	129	178	252	99	574	152
1953-54	122	127	184	215	117	582	147
1954-55	113	125	144	176	92	529	129
1955-56	123	186	142	217	126	516	153
Five-Year Average	125	138	152	221	108	550	145

The per student cost data for institution "D" suggest that it, too, might be suffering, although to a lesser degree, from this form of inefficiency. The utilization of instructional space must therefore be considered, and data on this point are necessary in any comprehensive analysis of expenditures for plant operation and maintenance.

Institution "F," which over a period of at least five years has had the highest per student expenditure for plant operation and maintenance, has the lowest percentage of possible utilization of instructional space as measured by either the room-period basis or the student-station basis. With the same instructional plant facility, institution "F," without undue discomfort, should be able to accommodate more than twice the number of students it had in the fall of 1953. For some time to come efforts by this institution to obtain funds to construct additional instructional facilities will have to be justified by reasons other than lack of space to accommodate increased enrollments.

In addition to the technics for analyzing plant operation and maintenance costs thus far discussed, there are others that are more frequently referred to by plant superintendents in their literature. One of these is the use of the square foot of floor area as a divisor for computing unit costs. The expenditures for each of the object items under plant operation and maintenance are expressed as amounts spent or budgeted for each thousand square feet of floor space. Gross expenditure figures, prior to proration of costs to the auxiliary enterprises and to the organized activities, have been used. The figures for floor area are for the entire physical plant, including auxiliary enterprises and organized activities.

The technic of analyzing expenditures on the basis of plant area is obviously not equally applicable to all the various objects. Expenditures for the supervisory office, police and watchmen, and autos and trucks expense would logically seem to have less relationship to the total square feet of floor area than expenses for janitorial service and repairs of buildings and equipment.

Another spatial concept frequently used by plant engineers as a divisor for computing unit costs of plant operation and maintenance is the cubic foot. Plant officials, in general, appear to favor the cubic foot, rather than the square foot, in computing unit costs of such services as maintenance and heating of buildings. The cubic foot is perhaps a somewhat better unit than the square foot as a measure for use within an institution, particularly when comparison is to be made between different types of buildings such as a gymnasium and a residence hall. For comparisons between and among institutions, however, the addition of the third dimension to the square foot unit has small effect on the accuracy with which the size of the plant is portrayed.

The data in Table 9 prompted several institutional officials to re-examine their insurance practices. At least one institution came to the conclusion that it was overinsured. In another, question was raised as to whether improvement in its fire protection facilities might result in economies through lower insurance rates. Several institutional officials and a few legislators, on examining these data, suggested that a study be made to determine if it might not be more economical for the state institutions to form their own group insurance program. Thus, the fact that an analysis technic is far from being perfect does not preclude the use of the data to suggest action that may lead to beneficial results.

The kinds of analysis of plant operation and maintenance costs that have been presented in this discussion are by no means exhaustive. Competent plant officials use these and many other more imaginative technics to measure efficiency of operations and to derive information that help them make administrative decisions. There is still plenty of opportunity for the invention of new kinds of analyses that will be useful in determining the needs for budgetary support of the function of plant operation and maintenance in colleges and universities.

ANALYSIS OF EXPENDITURES FOR INSTRUCTION

We now come to the most important category of expenditures for educational and general purposes--those for instruction.

This is the heart of the college program, the very reason for the institution's existence. Also, it normally requires a larger expenditure than does any other institutional function. A college or university may engage in many other public services, such as organized research, extension activities, and public entertainment in the form of intercollegiate athletics, but instruction is universally recognized as its primary function.

Paradoxically, however, expenditures for instruction have been subjected to less critical analysis than those for some other ancillary activities, such as libraries and plant operation and maintenance. This situation in all probability reflects the dogma, espoused by academic deans and faculty members, that no college or university can spend too much for instructional purposes.

There are never enough funds adequately to compensate well qualified faculty members for their services, never enough funds to purchase all the supplies and equipment that facilitate and improve the instructional programs, never enough funds to relieve faculty members of their many sundry chores of clerical nature, and never enough funds to send faculty members to every professional conference they should attend. Consequently, it is assumed that every dollar devoted to instructional purposes is a dollar well spent.

We ourselves are not disbelievers of this dogma; we believe in it as fully as any academic dean or faculty member. In fact, one of the primary purposes of any analysis of expenditures for educational and general purposes is to determine if an institution is putting every dollar it possibly can into the function of instruction.

Why, then, bother to analyze expenditures for instruction? One reason is this: There are many ways to spend a dollar. While every dollar devoted to instructional purposes is a dollar well spent, one must ask himself if it could have been used more effectively.

For example, although few institutions, if any, are in a position to pay each faculty member the full measure of his or her value, they can and do have the obligation to reward the competent more adequately than the less competent. An institution has the responsibility of attracting and retaining the most capable faculty it can with the funds available.

A second reason for analyzing instructional expenditures is to determine financial needs as they relate to efficiency of operation.

Granted that an institution can nearly always use more money for the support of its instructional programs, is it making the maximum use of its present teaching staff and facilities? One needs to study only a few colleges to observe that, with the same or nearly equal faculty-salary budget, one institution regularly manages to serve more students than another of comparable quality and curriculum. The latter institution certainly has the obligation to show why it cannot accommodate additional students with its present staff, in any request for funds to employ more instructors.

A third reason, one that is peculiar to a central coordinating agency for a group of colleges and universities, such as the New Mexico Board of Educational Finance or an education board of a religious denomination, is to equalize, as nearly as possible, the financial support of the member institutions.

A fourth and final reason for analyzing expenditures for instructional purposes is to develop such data as will help convey to legislators and to private donors an accurate picture of the financial needs of higher education.

In the ensuing discussion of the technics for the analysis of instructional expenditures, we shall use for illustrative purposes data gathered since 1951-52 for six New Mexico state institutions of higher education. We shall comment on the relative effectiveness of the various analytical technics and the use made of the resulting data.

What Expenditures Include

Expenditures for instruction, as defined in the 1935 report of the National Committee on Standard Reports for Institutions of Higher Education and the 1952 report of the National Committee on the Preparation of a Manual on College and University Business Administration, include salaries of college or divisional deans, faculty members, clerical employees, instructional supplies and equipment, and other departmental expenses. The last subcategory, other departmental expenses, consists of such items as staff benefits (if not budgeted under administration and general expenditures) and faculty travel.

The two basic technics of analyzing expenditures discussed in earlier articles are applicable to those for instructional purposes. These two technics yield data showing the percentage of total education and general expenditures budgeted for instruction and the amount per student used for this function. Table 11 shows the figures resulting from the application of these two technics to the expenditures for instruction for six New Mexico state institutions of higher learning.

Note in Table 11 that the two institutions with the smallest enrollments, "D" and "F," consistently devote a relatively small percentage of total educational and general expenditures to the directly productive function of instruction. Small institutions, those with

Table 11
Percentage of Total Educational and General Expenditures for Instruction, and Amount per Student for This Function, in Six State Institutions of Higher Education

	Year	Institution						Six Institutions Combined
		A	B	C	D	E	F	
Percentage of Total Educational and General Expenditures for Instruction	1951-52	59.6	67.2	61.6	44.0	61.3	48.8	59.5
	1952-53	60.1	61.8	60.4	43.5	61.7	46.9	58.5
	1953-54	61.1	63.1	57.9	48.9	56.6	46.9	59.0
	1954-55	61.0	61.8	60.1	50.4	54.4	48.4	59.0
	1955-56*	61.0	58.7	58.2	50.2	57.1	49.7	58.5
Expenditure per Full-Time-Equivalent Student for Instruction	1951-52	$494	$548	$415	$426	$455	$857	$494
	1952-53	490	480	544	459	463	780	496
	1953-54	507	470	486	478	432	815	494
	1954-55	460	428	417	450	334	815	440
	1955-56*	485	510	424	525	456	848	490
Estimated Full-Time-Equivalent Student Enrollment, 1955-56, Entire Year		4115	1825	1020	497	1022	189	

*Data for 1955-56 based on budget estimate.

enrollments of less than a thousand students, are inherently less efficient than those with larger enrollments, and the situation can be corrected only as an institution enrolls more students.

The six institutions combined regularly manage to get approximately six out of every ten dollars expended for educational and general purposes into the directly productive function of instruction. This appears to be about as high a ratio as can be maintained in institutions with enrollments that permit economical operation.

The data on amount per full-time-equivalent student for instructional purposes, shown in Table 11, are useful in answering questions pertaining to the equality of support among institutions. The New Mexico Board of Educational Finance operates on the principle that each of the state institutions should be given sufficient financial support to develop and maintain instructional programs of similar quality, taking into account the academic level, undergraduate and graduate, and the extent of professional and highly technical curriculums. In other words, any program offered at one institution should be supported at a quality level approximately the same as that of comparable programs in the other institutions.

Any wide variations in expenditure per student must therefore be explainable in terms of differences in such factors as level and type of instructional programs and size of enrollments. For example, institution "F," which consistently expends the highest amount per student for instruction, has too small an enrollment to permit economical operation. It has a very low student-faculty ratio and a high proportion of classes enrolling fewer than 10 students. Its curriculum consists exclusively of undergraduate and graduate programs in several highly specialized fields of technology.

We wish to caution the reader against concluding that the New Mexico procedure of equalizing the support of the state colleges and universities is to appropriate sufficient funds to enable each institution to maintain a given level of expenditure per student. The procedure of which we speak is a much more complex affair. The value of the figure on expenditure per student for instruction for a given institution lies in the fact that it constitutes a summary, or gives a quick picture of the adequacy of support for this function relative to other institutions. In our experience, the figure is a good subsequent check on the soundness of the procedure that has been used to develop the instructional budget. Information on expenditure per student is treated as a result of the procedure, not as its starting point.

In the definition of the expenditure category of instruction, it was noted that this function consisted of a number of different object items. It is frequently useful for institutional administrators to have available comparative data for other institutions on these object items.

The most important categories of instructional expense are shown in Table 12 together with the amounts per FTE student and the per cent of the total spent by six New Mexico institutions in 1955-56.

Table 12
Instructional Expenditures, By Object,
Six Institutions, 1955-56

	Dollars	Per Cent
Total	$489.83	100.0
a) Instructional Salaries....................	368.02	75.1
b) Instructional Supplies and Equipment..............................	29.84	6.1
c) Clerical Service for Faculty.............	16.28	3.3
d) Student employment........................	16.36	3.3
e) Staff benefits..............................	19.35	4.0
f) Staff travel................................	2.84	0.6
g) Academic vice president...................	9.85	2.0
h) Graduate school office....................	2.23	0.5
i) Deans' offices..............................	16.17	3.3
j) All other (faculty research, etc.)........	8.89	1.8

Each of the object items under the budget category of "instructional expenditures" can be subjected to further analysis, which frequently produces interesting data of aid to institutional administrators. For example, expenditures for out-of-state travel by the faculty of the New Mexico institutions have been the topic of two intensive studies by the Board of Educational Finance. The amount expended for faculty travel is relatively small. For the six institutions combined it claims only 0.6 per cent of the budget for instructional services. One might conclude that the item is hardly important enough to warrant much analysis.

But, oddly enough, over a period of years out-of-state travel by faculty members has been the subject of more comment and adverse criticism by legislators, state fiscal officers, and newspaper columnists than perhaps any other single institutional activity. It has therefore been necessary to make detailed analyses of expenditures for the travel item for the purpose of developing a policy statement that is defensible from an academic point of view and understandable to the public.

The remainder of this discussion will deal with what is, without exception, the most important item under instruction--the expenditures for instructional salaries. These expenditures in the New Mexico institutions claim about three-fourths of the budgets for the function of instruction.

Analysis of Instructional Salaries

The effective use of funds available for instructional salaries can be measured by two kinds of data: (1) those that show distribution of salaries among the faculty, and (2) those that pertain to the productiveness of the faculty and the economy of the instructional programs.

The first kind of data is found frequently in the literature on higher education and is familiar to virtually all college and university administrators. The second kind of data includes such measures as student-credit-hour production per faculty member and expenditures for instructional salaries per student-credit-hour. Analyses that yeild both these types of data are necessary in any comprehensive study of effective expenditure of funds for instructional salaries.

From the point of view of a comprehensive analysis of institutional operations, faculty salaries have two important characteristics: average and range. These two salary characteristics have direct bearing on the success of the institution in attracting and holding competent faculty members. The significance of a high average faculty salary to the well-being of an institution is recognized by virtually all college and university administrators, but recognition of the importance of a wide range in salaries among the academic ranks and within each rank is not as universal. In two institutions with the same average faculty salary, all other factors being equal, the one with the greater range in salaries is likely to have the better staff. Competent young faculty members frequently will be attracted to and elect to remain with an institution at a lower salary than they might receive elsewhere, if prospects for high salaries are good with academic advancement.

Table 13 shows the faculty salaries for 1955-56 for two state institutions of higher education. The data reflect two divergent faculty salary practices, though the average (mean) salary for all ranks combined is about the same at each institution. Institution "A" maintains a reasonably wide range in salaries within each rank and allows for overlapping between two adjacent ranks. Institution "B" follows the practice of a uniform salary for all members of a given academic rank, with only occasional exceptions; professors who are department heads receive a slightly higher salary than those who are not, and, at the rank of assistant professor, some deviations from the salary schedule occur as the result of "salary adjustments." On the whole, institution "B" makes no attempt to recognize differences in individual merit, except by means of promotion in rank, or to encourage the most capable into greater effort through salary inducements. Great significance attaches to the fact that the top salaries at every rank are higher in institution "A" than in institution "B." It is these top salaries that attract and retain first class faculty members.

Table 13
Faculty Salaries for 1955-56 for Two State Institutions of Higher Education, Nine-Months Basis*

Institution		Professors	Associate Professors	Assistant Professors	Instructors	For All Ranks
"A"	High...........	$8800	$6500	$5900	$4400	$8800
	Low............	6000	5250	4000	3600	3600
	Mean...........	7125	5773	5025	3985	5772
	Number at rank.	69	45	70	23	207
"B"	High...........	$7500	$6228	$5664	$4368	$7500
	Low............	7272	6228	4740	4368	4368
	Mean...........	7351	6228	5137	4368	5784
	Number at rank.	26	15	36	17	94

*Includes only faculty members who devote full time to instruction.

We are firmly convinced that, over a period of years, the salary policy followed in institution "A" will permit the attraction and retention of a much more capable faculty than the policy of institution "B," assuming that each has the same amount per faculty member for salaries. In fact, institution "A" might well be encouraged to increase the range of its salaries, particularly at the upper levels. One nationally recognized institution recently visited maintains a ratio of about 4 to 1 between its highest and lowest faculty salary, or a range from about $4000 for the lowest salaried instructor to about $16,000 as the top for a professor.

Closely related to the question of salaries is that of academic rank. Table 14 shows the staffing pattern of six state institutions of higher education for 1952-53 and 1955-56. The data show that no one pattern fits all the institutions, and even in the relatively short period of four years wide variations occur within a single institution in the percentages at each rank. In 1952-53 institution "C," for example, used only two ranks: "professor" and "instructor."

This organizational pattern, while it is not to be recommended, is not unusual in small institutions. By 1955-56 institution "C" had reclassified its faculty into four academic ranks, which is the more conventional pattern.

Table 14
Academic Ranks of Faculty Members of Six State Institutions of Higher Education

Institution	Year	No. of Faculty Members	Percentages of Each Rank			
			Professor	Assoc. Prof.	Asst. Prof.	Instructor
"A"	1952-53	190	27.4	26.3	33.7	12.6
	1955-56	234	35.9	20.1	32.5	11.5
"B"	1952-53	157	28.0	14.0	30.6	27.4
	1955-56	167	28.7	13.8	39.5	18.0
"C"	1952-53	58	29.3	--	--	70.7
	1955-56	59	23.7	27.1	42.4	6.8
"D"	1952-53	38	18.4	71.1	7.9	2.6
	1955-56	40	12.5	70.0	7.5	10.0
"E"	1952-53	54	14.8	27.8	24.1	33.3
	1955-56	65	12.3	32.3	41.5	13.9
"F"	1952-53	16	18.8	25.0	50.0	6.2
	1955-56	19	26.3	42.1	26.3	5.3
All institutions Combined	1952-53	513	25.5	23.8	25.7	25.0
	1955-56	584	28.1	24.5	34.6	12.8

*Includes all persons with academic rank, whether part-time or full-time member of teaching staff.

In contrast to the others, institution "D" accords the rank of "associate professor" to more than two-thirds of its faculty, and more than 80 per cent of its faculty are in the upper two ranks. Its faculty is no more outstanding than those of the other institutions from the standpoint of training or experience or scholarly maturity. Under the circumstances, it must be concluded that at institution "D" academic rank is much easier to obtain than in the faculties of the other five institutions.

Occasionally the question arises as to whether or not there is an ideal staffing pattern. If there is such a pattern, it would probably be for an institution to have all "full professors." Unfortunately a faculty organization of this ideal type, within any reasonable concept of the qualifications of a "full professor," is not practicable. As a practical guide, we generally advocate for a degree-granting college a staffing pattern with a nearly equal number of faculty members at each of the four conventional ranks. An institution might have a larger or smaller proportion in the upper two ranks, depending upon its success in attracting and retaining mature scholars.

Another element of faculty organization that has important bearing on salaries is the number of students per faculty member. Table 15 illustrates the possible effects of varying student-faculty ratios on the average salary for an institution with an enrollment of 1000 students and a total instructional salary budget of $350,000. A student-faculty ratio of 10 to 1, requiring 100 faculty members, would result in an average salary of $3500. With the same salary budget, an institution could provide for an average faculty salary of $5225 by employing only 67 faculty members, which would result in a 15 to 1 student-faculty ratio. But by employing only 44 faculty members and maintaining a student-faculty ratio of 22.5 to 1, an institution would have the funds for an average faculty salary of $7950.

The impact of a given student-faculty ratio on average salaries for each of the four academic ranks is even more impressive. The average salaries for each of the ranks, shown in Table 15, are computed on the assumption that there would be a nearly equal distribution of faculty members at each of the four academic ranks. If an institution of a thousand students with a total instructional salary budget of $350,000 were to maintain a student-faculty ratio of 10 to 1, the average salary for instructors would most likely be about $3000 and the average salary for professors not more than $4300. The salary of the highest paid faculty member in this organization would probably not exceed $5500 or $6000. With the same total salary expenditure and a student-faculty ratio of 22.5 to 1, the average salary for instructors could be $4600 and the average salary of professors about $12,000. This faculty organization could provide for several professors whose salaries might be as high as $15,000 or $16,000.

If each of the six student-faculty ratios in Table 15 were to represent a different institution, we have no doubt but that the best faculty would be found in the institution with the average faculty salary of $7950 and a student-faculty ratio of 22.5 to 1. This institution is in the most favorable position to retain its experienced faculty members and to compete with industry, government and other colleges and universities for top quality talent. It is also in the best position to attract promising young faculty members because it can offer both a decent starting salary and prospects for high salaries with advancement. Undoubtedly there are certain advantages to a low student-faculty ratio, but these advantages accrue only if an institution can, at the same time, afford to support a high quality staff. Too frequently the price of maintaining a ratio of 12 or 13 students per faculty member is a low average faculty salary. Scholars on the faculty who insist that a low ratio of students to instructors is essential to a good academic program usually fail to realize what a terrific price they pay in low salaries for that condition. Nor is

Table 15
Six Possible Faculty Organizations for an Institution With an Instructional Salary Budget of $350,000 and an Enrollment of 1000 Full-Time Students

Funds Available for Instructional Salaries	Students per Faculty Member	No. of Faculty Members	Average Faculty Salary	Number and Average Salary at Each Rank							
				Professor		Assoc. Prof.		Asst. Prof.		Instructor	
				No.	Average Salary	No.	Average Salary	No.	Average Salary	No.	Average Salary
$350,000	10.0	100	$3500	25	$4300	25	$3500	25	$3200	25	$3000
350,000	12.5	80	4375	20	5250	20	4650	20	4000	20	3600
350,000	15.0	67	5225	17	6650	16	5675	17	4600	17	4000
350,000	17.5	57	6140	14	8400	15	6720	14	5200	14	4200
350,000	20.0	50	7000	12	10,000	13	7830	13	5800	12	4400
350,000	22.5	44	7950	11	12,000	11	8820	11	6400	11	4600

there evidence that a low student-faculty ratio, of itself, results in a superior academic program. It is much better for a student to be one of 20 or 25 having contact with a first-class scholarly mind on the faculty than to be one of 10 or 12 having contact with a faculty member of the mediocre level of ability that usually results from a low salary scale.

Efficiency of the Instructional Program

Data dealing with such salary characteristics as average, range and staffing pattern, which were discussed in the preceding section, reflect an institution's attempt to attract and hold as good a faculty as it possibly can within the limits of funds available for instructional salaries. These data do not, however, give any indication of the general economy of the instructional programs. This requires a different kind of analysis.

The varieties of data on instructional programs that might be collected and studied are numerous. For the purpose of measuring economy of operations, the most relevant are those that show efficiency of use of faculty manpower.

Since Doi and Kettler have discussed the detailed analysis of instructional costs in other articles in this volume, I will conclude with some general observations on the kinds of data that are suitable for this purpose.

1. Extent of different courses taught. The scope of subject matter offerings should be measured in terms of the total credit-hour value (semester-hour or quarter-hour) of all the different courses taught in the institution during any given period, such as an academic year. Some analysts have used the "course" as a unit for expressing the scope of subject matter content. This is not a satisfactory unit, because some courses are given for one credit, some for two or three credits, and others for varying numbers of credits up to five or even 10. For accurate statistics it is necessary to convert the course offerings into a total of their credit-hour value. Each course is counted in the total at its particular credit-hour value. To obtain an indication of the scope of subject matter offered, each course is counted only once, regardless of the number of times it may have been repeated during the year.

In well managed institutions the course offerings are regularly scrutinized by the faculty and the officers of academic administration for the purposes of: (1) combining or redesigning courses in the interest of the best possible integration of the program of instruction; (2) eliminating unnecessary overlapping and duplication of content, and (3) discontinuing courses and programs for which the student demand is insufficient.

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One of the unfortunate results of overproliferation of course offerings is the prevalence of an unduly large number of small classes. Even worse, from the point of view of curriculum organization, is the likelihood of loading the programs of students with highly specialized courses at too early a stage in the students' scholarly advancement and of wasting the time of students in useless repetition of content in supposedly different courses.

2. Semester hours of classes taught. This figure differs from that on scope of offerings in that it represents a count of the credit hours of classes taught and not of different courses. It is a measure of the volume of teaching, not the range of subject matter covered. A course may be offered more than once during the academic year. Thus, in calculating the scope of course offerings, a three-semester-hour course would count as three, but if five different class sections of the course were maintained, they would count as 15 in the analysis of semester hours of classes taught.

3. Student credit hours produced. The student credit hour is the best available measure of the "production" of instructional services in the department or institution. It is derived by multiplying the number of students in each class by the number of credit hours the class carries and then adding these products for all the classes taught. The grand total of student credit hours produced in an institution is directly related to the total number of full-time-equivalent students, inasmuch as each full-time student normally earns 30 to 32 semester hours, or 45 to 48 quarter hours, of credits in an academic year.

4. Percentage of credit hours taught in small classes. An important measure of instructional efficiency is the degree of prevalence of "small" classes. This measure may be expressed either in terms of the total credit hours of small classes or the percentage that the credit hours of small classes is of total credit hours of classes taught. The selection of the point at which a class is considered "small" is arbitrary. In an actual analysis, it is advisable to select more than one point, such as fewer than five and fewer than 10 students.

While some small classes may be necessary in any well organized instructional program, the number of classes that enroll no more than four students should be held to the minimum, particularly at the undergraduate level. A class with only two or three students enrolled generally costs the institution just as much for faculty salary as a class with 25 or 30 students. Furthermore, the students themselves do not get as much stimulation from a very small class as from one that is of reasonable size, especially when the instructor, as is nearly always the case, teaches a small class by the same method he would use in a larger one.

5. Credit hours taught in unneeded duplicate sections. In arranging an instructional schedule for a given semester or term, it is necessary to estimate in advance whether the number of students who will enroll in each course is larger than can be accommodated in a single class. Especially in required undergraduate courses, duplicate sections usually must be maintained in order to provide for all the students who enroll. If the estimate of the number of duplicate sections needed is not made wisely, it is easily possible to set up too many and thus to require more instructors than should be necessary.

Minimum of 25 Students

The authors, in their studies of instructional programs, generally proceed on the assumption that each undergraduate class should be filled up to a minimum of 25 students before a duplicate or additional section in the same course is organized during a given term or semester.

6. Unnecessary repetition of courses during the regular academic year. In order to provide suitable opportunity for the arrangement of student programs, it usually is necessary to give some courses in more than one semester or term, especially when the course is one that generally enrolls a considerable number of students. A department sometimes will repeat a course during the regular academic year when the total enrollment for the year is no larger than could readily be handled in a single class in one term or semester. Here again the standard for a wasteful repetition of courses is arbitrary. We generally consider a total enrollment of fewer than 20 students in all sections of a course taught during the regular academic year as indicative of wasteful repetition.

7. Average (weighted) size of classes. An excellent measure of the efficiency of an instructional program is the average size of the classes that are taught. Within reasonable limits, the larger the average size of class the more efficient the use of faculty time and energy. The average size of class must be "weighted" in accordance with the number of credit hours for which each class is taught. For example, a class carrying three semester hours of credit should be counted into the average at three times the weight of a class carrying only one semester hour of credit. In actual practice, the weighted average size of class is derived by dividing the total number of student credit hours produced by the total credit hours of classes taught.

8. Average student credit hours produced per full-time-equivalent faculty member. The average student credit hours produced per full-time faculty member is the best single measure of efficiency of operation of an instructional program. Within reasonable limits, the larger the average number of student credit hours per faculty member, the more efficient the instructional program. This figure is obtained by dividing the total number of student credit hours produced by the total number of full-time-equivalent faculty members.

Two factors are involved in the average number of student credit hours produced by a full-time faculty member: the average credit hours of teaching per faculty member, and the average weighted size of classes. For example, if the average faculty member teaches 12 credit hours per semester, or 24 per year, and the average weighted size of classes is 21, the average number of student credit hours produced would be 504. If faculty members teach an average of 15 credit hours per semester, or 30 per year, and if the average class size is 17 students, the average student-credit-hour production per faculty member would be 510.

In general, improvement in student-credit-hour production per faculty member should be accomplished by increasing the average size of classes rather than by increasing the teaching loads of faculty members. In a well managed institution the average teaching load of faculty members is held as low as possible, while the student-credit-hour production per faculty member is held as high as possible.

9. Instructional salary cost per student credit hour produced. This measure of cost is derived by dividing the total expenditures for instructional salaries by the number of student credit hours produced. It must be recognized that the instructional salary cost is not the total cost of producing a student credit hour. Some departments, such as the biological or physical sciences, have rather heavy expenditures for instructional materials and laboratory supplies. Other departments, such as the social sciences and the humanities, require extensive provision of library resources. In addition to these and other direct costs, a statement of total cost of producing a student credit hour would necessarily include an appropriate allocation of indirect costs such as physical plant operation and administrative overhead. But since salaries constitute the largest single item of educational expenditure, and also since they are an item easily isolated in the financial accounting, the faculty salary cost per student credit hour is a useful index of the general economy of management in an instructional program.

To be of greatest usefulness, each of the foregoing kinds of data should be organized by course levels. We use three levels of courses in their analyses of instructional programs--lower-division undergraduate, upper-division undergraduate, and graduate. Lower-division courses include all those open to freshmen and sophomores. Upper-division courses are those open to juniors and seniors, but not to freshmen and sophomores. Graduate courses are those open only to students who have completed requirements for the bachelor's degree. In virtually every institution offering advanced degrees graduate students are permitted to meet a considerable part of the requirements for the master's degree through upper-division courses. It must therefore be noted that data dealing with graduate-level courses will not include all the courses that may be taken by graduate students, but only those that are supposed to be composed exclusively of graduate students. In virtually every upper-division course in which graduate students are enrolled, they normally would be distinctly in the minority.

Departmental Comparisons

Institutional totals and averages relating to efficiency of instructional programs are useful for conveying to legislators, members of controlling boards, and officers of central institutional administration a quick picture of status and trends. Such data, however, are of little value for deans and department heads.

For internal use within a college or university the most meaningful organization of the data is by subject fields or departments. This permits each department to compare its statistics with those for other departments in the institution and with similar departments in other colleges and universities. Possible areas of inefficiency and excessive costs can thus be identified.

Arrangement of the data by subject-matter fields or departments runs into difficulty because there is no standard pattern of academic organization followed by all institutions. In some colleges, for example, English, speech, dramatics and journalism are maintained as separate departments. In other institutions these subjects are combined in a single department of English. For purposes of analysis it is necessary to make some arbitrary combinations or separations of subject-matter fields and departments in order to present data that are comparable among a group of institutions.

One other sort of data, besides those that were described in the preceding section, has been found useful in departmental analyses of instructional programs. The number of degrees of each level awarded each year in each major subject indicates the extent to which the programs of the various departments serve students who concentrate in the respective fields. Information on the number of degrees awarded each year in each subject-matter field in each institution in the United States is available in an annual publication of the U.S. Office of Education.

Inasmuch as the number of students graduating with a major concentration in a given subject may fluctuate considerably from year to year in any college or university, a suitable index of departmental production of major students may be best obtained by using the total degrees granted over a period of time, such as three years. The available data are for the total of degrees granted during an entire 12 month year, including the summer session. It should be recalled that the other data on departmental programs, used for illustrative purposes in this article, are for the regular academic year of nine months, excluding the summer session.

The number and kinds of degrees granted in a given department reflect the general purposes of its program. Some departments in a college or university may not offer opportunity for a major concentration in their subject-matter fields, but may confine their courses to those suitable for general education or for a minor concentration only. If the department does offer opportunity for a major concentration for the bachelor's or master's degree, it normally has to maintain a reasonably broad range of courses for its major students.

Question always must be raised as to whether the number of students served by the degree program in a department is sufficient to warrant the maintenance of the range of courses necessary for effective specialization. In considering the analysis of degrees granted it is important to remember that the subject-matter classification of degrees may not correspond exactly to the departmental organization, as explained in a preceding paragraph.

The general question needs to be asked as to whether the subject fields that seem to have a high cost in almost every institution actually are contributing proportionately more to the effective education of students than departments whose costs are more reasonable. And in all fields, high cost or otherwise, expansions should be scrutinized carefully. Too frequently a department will launch a degree program without regard to either cost or student demand. Perhaps the most effective means of curbing such expansionist tendencies on the part of overzealous department heads is for the dean or president to discuss with them program-analysis data of the kind discussed.

The subject-field arrangement of instructional data also is helpful for institutional administrators, board members, and legislators interested in the problem of unnecessary duplication of effort among a group of state institutions. Careful examination of such data will help answer many questions such as whether duplication is justifiable and necessary or whether it is unwise. Not all duplication is unwise or uneconomical, and the fact that a number of institutions maintain degree programs in a particular field is not prima facie evidence of uneconomical duplication.

Data such as number of degrees granted in a single year by one institution as compared with another in the same department only point to areas of possible waste of energy and resources. In general, uneconomical duplication exists when two or more institutions maintain similar programs of specialization for which student demand at one or more of the institutions has proved to be small and unsteady over a period of several years.

There are circumstances in which the continuation of a program is justified even though the student demand is small. A newly introduced program at first may serve only a limited group of students, but the number soon may increase to a point permitting economical operation.

A reasonable length of time should be allowed in which to experiment with a new program, whether graduate or undergraduate, but the institution continually should evaluate the need and strength of each program and be prepared to justify the expenditure of funds for its continuation. Sometimes a program that serves only a few students, and therefore has a high cost, is justified from the point of view of the needs of the state as a whole. Seldom, however, will such a program need to be offered in more than one institution.

Other Areas for Analysis

The kinds of analyses of instructional expenditures discussed in this article are by no means exhaustive. Nor do they represent a complete solution to the problem of determining the financial needs of instructional programs. It is particularly important to note that the technics of analysis here discussed have little relation to the quality of instructional services. The question of the quality of the services rendered students is far more important than the considerations of efficiency on which these articles have centered attention.

In general, the question of the quality of an institution's instructional program is a concern of the academic officials, rather than of those charged with responsibility only for business and financial matters. Improvement in the efficiency of the use of institutional facilities and resources is important, however, for it is one of the basic methods by which an institution can improve the quality of its services.

It should be borne in mind that we have been concerned only with the analysis of expenditures for educational and general purposes, and not even for all expenditure classifications in that category. Several major areas of institutional operation have not been treated in this series of articles, such as research, organized activities relating to instructional departments, extension services, auxiliary activities, scholarships, debt service, and capital outlay. In many of these areas the technics of analysis that have been illustrated for educational and general expenditures could well be applied.

One area omitted from discussion in this series of articles that is in great need of critical analysis is intercollegiate athletics. In many institutions throughout the country even the most elementary information about the finances of intercollegiate athletics is a closely guarded secret. Analytical treatment of data on expenditures for institutional athletic programs is virtually unknown in the published literature of higher education. The sums of money involved in this activity, however, often are large. The balance between income and expenditure is often a red figure of substantial size, made up by the application of funds that might otherwise have been available for improvement in faculty salaries.

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The omission of many areas of institutional operations from the present treatment of the analysis of expenditures does not mean that such analyses would be unlikely to yield fruitful results. Like the analyses that have been suggested in other areas, the purpose would be to discover means by which the largest possible amount of institutional resources may be channeled into the programs and services that contribute most directly and effectively to the basic aims and purposes of the institution.

Virtually every institution in the country considers that it has inadequate resources to render all the services it would like to provide at a satisfactory quality level. Any administrative procedure, such as expenditure analysis, that results in the diversion of supporting resources into the most productive forms of expenditure, deserves encouragement. The mounting demands for higher education, which bid fair to increase more rapidly in the future than the supporting resources in most institutions, make more necessary than ever before a careful scrutiny and analysis of every dollar of expenditure to make sure that it is producing the maximum of educational value.

Conclusion

Higher education has come a long way in America since the first college was established more than 300 years ago. The scope of services has grown extremely complex, and the number of students served has expanded to three million or more. These expansions have brought difficult problems of financing. The growth of services in higher education has been to a considerable extent paralleled on the part of the general public by an increasing understanding and appreciation of the value of the programs carried on by colleges and universities. The willingness of the people to support higher education is shown by the 400-fold expansion in current income for educational and general purposes in the last 75 years, from approximately $5 million in 1879-80 to more than $2 billion in the most recent year for which data are available.

It has not been easy to get the funds required to support the constantly expanding program of higher education in the United States. The very lifeblood of many able leaders in the institutions of this country for many generations has been put into the efforts to get money for endowment, for buildings, and for current support from churches, alumni, philanthropic foundations, private donors, and legislative appropriating agencies of the federal, state and local governments.

The methods by which funds are obtained for the support of higher education seem to be undergoing a profound change. The day of successful fund raising, based on a forceful leader's ability to spellbind prospective donors with oratorical pleas for generous gifts for some dimly defined institutional purpose, is drawing rapidly to a close.

Today those whose purse strings have to be loosened to provide the necessary support for higher education have to be convinced of the needs by different methods.

Increasingly the appropriations committees of legislative bodies are subjecting the requests of publicly controlled institutions to careful budgetary analysis. Appropriations are determined less and less on the basis of political pressures and impassioned pleas by lobbying presidents and their friends and more and more on the basis of cold, well reasoned analyses of institutional expenditures and programs of services. Church groups, philanthropic foundations, and donors of large gifts increasingly are following the same procedure in determining the extent of their support of privately controlled colleges and universities.

The institution that expects in the future to be successful in its quest for the funds needed to support its program can be well advised first to put its own house in order. For an institution to have readily available the necessary facts and figures that indicate the efficiency of its own operations is impressive and encouraging to those who are expected to provide funds for its support. A record of improved efficiency in the use of funds is one of the best possible selling points in the contact with those from whom further support is being sought.

The colleges and universities of the United States are just now in the early years of what probably will prove to be the period of the most rapid and longest sustained expansion in all the history of higher education. Students who enter college today are staying longer than ever before; the percentage of young people who are going to college continues to increase steadily and rapidly, and the number of young people of college age in this country will increase more than 70 per cent in the next 15 years.

Unless some unforeseen catastrophe intervenes, the combination of these three factors undoubtedly will result in phenomenal increases in total college enrollments. The amount of funds that will be necessary for the support of educational services and for capital outlays to provide for the expanded enrollment will be far beyond the present level of income for higher education. Some of the necessary support unquestionably will have to come from economies and improved efficiency in the use of available institutional resources.

It is by no means too early for college and university officials to begin the practice of studying and analyzing their present expenditures to determine where and how more and better results can be obtained from the funds now available. Such results are the whole purpose of the technics and procedures for the analysis of college and university expenditures.

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X. The Long Term Budget Projection — A New Management Tool for Colleges and Universities

. . . . Sidney G. Tickton

For many years, industrial firms, merchandising organizations, and government agencies have made long-range projections of income and expenditures on which to base their policy decisions on production planning, sales programs, new plant construction, new debt commitments, etc. The merchandising of a new product for nationwide consumption, for example, may span a decade from the time the laboratory research has been completed until the sales promotion has placed the product in millions of homes. Commitments of time, money, and resources can be allocated by responsible corporate officials to a long-term program only after the detailed plans have been worked out, plans that take into account all factors likely to be relevant. Sometimes two or more assumptions are used to allow for possible variations in timing, prices, costs, the extent of the market, the availability of finances, and the like.

The building of a new highway, bridge, airport, or public utility is likewise preceded by a detailed projection into the future of the operating accounts, giving full effect to possible changes in economic, social, and environmental factors that may impinge on the outlook for receipts and expenditures. If the financing involves the issuance of securities, particularly revenue bonds, the projections are the work of appropriate specialists, are heavily documented, and may cover a time period of twenty to thirty years. They frequently become the entire basis upon which the project is organized, financed, and carried forth.

A less complicated example involving long-range projections of receipts and expenditures can be observed any day in the real estate field. Apartment houses, shopping centers, and office buildings are bought and sold on the basis of a probable income and expenditures analysis running from a few years to half a century ahead.

Although colleges and universities have long-range-planning problems similar to those of industry and trade, it is unusual for them to engage in long-range fiscal planning. Recently, a few small liberal arts colleges decided to work out a long-range-analysis technique built around their budgets. Their objective was to gain some financial perspective for the decade ahead, taking into account all their long-range commitments such as tenure, automatic-increase salary schedules, fringe-benefit arrangements with escalator clauses, and current

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maintenance on buildings to be constructed from funds provided by special gifts, campaigns, or borrowing, as well as rising prices and nationwide increases in the levels of faculty salaries.

These colleges recognized that institutions of higher education are not strictly business activities but that, on the financial side, their operations are certainly subject to business-type analysis. With the perspective provided by the projections, they were able to arrive at some new policy decisions on size of student body, faculty, building program and gift program, educational objectives of the college, and details of the curriculum, with the knowledge of what each individual decision meant to the operation of the college as a whole.

The purpose of this paper is to describe the process followed by one of these colleges, to indicate the types of data needed and the basis of the projections made, and to describe the results obtained. By using a technique similar to the one described, other colleges and universities can work out their own future pictures (in greater or lesser detail as their situations warrant) and can use organized data as a basis for new decisions on their future activities.

Another purpose of this paper is to indicate that the analysis process, although not difficult, requires considerable discipline; that is, the effect of every management decision on the budget, this year, next year, or for the entire period ahead, must be taken into account. One decision may involve a number of additional decisions; for example, a projection of the size of the student body requires related projections on the size of the faculty, the size of classes, number of courses, and space requirements. Precision of projection is not as essential as is the reasonableness of the estimates and the following through of the process at all points where there are budgetary consequences.

The management problems of colleges and universities will grow tremendously, both in size and in complexity, during the next few years. To meet these problems, top officials will need to sharpen old management tools and fashion new ones. The long-term budget projection is just such a new management tool.

We hasten to add, however, that the particular procedure described in this paper is only an example of an administrative technique which is in the early stages of development. Officials who prepare long-range projections for colleges and universities could be expected to improve the technique during the next few years and to incorporate for each college some amendments to reflect the needs of that particular institution. At some colleges and universities it might be necessary to set down a series of alternative assumptions and to run through the entire projection process a number of times before arriving at a series of figures which are both practical and desirable.

Description of the College

For the purposes of this case study, we shall call the institution that we are describing Ashford College. It is a four-year liberal arts college located on a 60-acre campus, in a town of 30,000 in the Midwest. Originally started in the 1830's and originally related to both Congregational and Prebyterian churches, the college is now a privately controlled institution accredited to the North Central Association. It offers B.A., B.Mus., and B.Mus.Ed. degrees.

There are 800 students, 64 per cent of whom are men. Ten per cent of the students are married. Of the students, 556 live on campus in college-owned properties, 150 live on campus in fraternity houses, and 94 are commuters and live at home. Seventy per cent of the students come from a radius of 300 miles, nearly all from middle- and upper-middle income families. Half of the students who enter Ashford do not stay for the entire four years. Drop-outs include many women who marry and some men who transfer to five-year programs in engineering and business administration, as well as some students who transfer to the state university for preprofessional courses.

Ashford's campus is surrounded by the town and has been protected in recent years by the purchase of adjoining properties, some of which have been demolished and others of which have been turned into college offices and residences. It will be necessary to buy additional adjoining property in future years. The college plant consists of three classroom and office buildings, two gymnasiums, a music building, a library with 85,000 volumes, observatory, infirmary, chapel, athletic field and dormitories. Laboratories, libraries, and classrooms are equipped primarily for the benefit of the student rather than for research.

Although a few of the buildings are relatively old, the plant is in first-class shape, and extraordinary maintenance is not a problem. The campus needs some new landscaping, and a new fine arts building is planned for 1962. Dormitories, dining halls, and student union facilities are used to capacity. An expansion of the college will require additional living quarters and recreation and eating facilities.

Classes meet five days a week, primarily between 9 A.M. and 4 P.M., and on Saturday morning. The school year runs from September 20 to June 5. Although there is no summer program, the college acts as host to a number of conferences during July and August, which permits it to employ its dormitory and dining hall staff on a year-round basis.

The college engages in intercollegiate athletics with neighboring institutions. There is a comprehensive intramural program; there is also an ROTC unit to which most of the men students belong.

The First Step: Background Data

As the first step toward the preparation of a long-term budget, Ashford's president asked the business manager to assemble some data on the operations and activities of the college for the past ten years. The information submitted is shown in Table 1.

The business manager found that nearly all the information requested was readily available from the books and records of the college. In setting down the student and faculty figures, he used the full-time equivalents averaged for the year. Faculty included those on leave with pay, excluded those on leave without pay. Physical education instructors were included, but ROTC officers were excluded, inasmuch as their salaries are not paid by the college. Fringe benefits included the college's contribution to its pension plan, social security, major medical insurance, and group life and health insurance.

The Second Step: Assumptions for the Future
(United States as a Whole)

As a second step toward the preparation of a long-term budget for his college, Ashford's president, with the head of his economics department, worked out a number of basic assumptions about the character of the United States economy as a whole during the next ten years. Within this framework, he worked out with his dean some assumptions on the outlook for higher education. The objective was to improve the reliability of the calaculations by allowing for changes likely to occur in the environment in which the college would operate. The assumptions for the years 1959-70 were as follows:

1. The United States will be blessed with a high-employment economy without a war or other national disaster.

2. Prices can be expected to increase during the period, say, about one per cent each year on the average.

3. The number of students going to colleges and universities can be expected to double by the end of the period.

4. State universities, city colleges, and community and junior colleges will provide for a large share of the increased college enrollment.

5. There will be a substantially larger number of applicants for admission to private liberal arts colleges. These colleges will be able to select students of better than average academic ability. Parents of the students (except scholarship students) will be able and willing to pay an increasing tuition charge.

6. The large number of applicants to private liberal arts colleges and their willingness to pay increasing tuition will be made

Table 1. Historical Data on Ashford College 1949-59

Item	1948-49	1952-53	1957-58	1958-59
Data on Students and Faculty				
Number of students	834	775	759	800
Number of faculty	70	67	63	65
Student-faculty ratio	11.9:1	11.6:1	12:1	12.3:1
Average tuition per student	$ 470	$ 593	$ 806	$ 817
Total compensation of faculty:				
Salary	$ 262,374	$ 285,733	$ 355,111	$ 389,790
Fringe benefits	9,736	18,572	23,270	30,770
Average compensation of faculty:				
Salary	$ 3,748	$ 4,265	$ 5,637	$ 5,997
Fringe benefits	139	277	369	473
Data on endowment and gifts				
Amount of endowment (book value)	$2,914,300	$4,103,600	$4,472,800	$4,600,000
Total income from endowment	177,862	184,019	201,889	221,830
Rate of return (on book value)	6.10%	4.48%	4.51%	4.82%
Amount of gifts received:				
For endowment	$ 143,400	$ 57,200	$ 100,414	$ 100,000
For plant	---	---	30,000	40,000
For other uses	39,000	100,000	210,874	326,091
Data on educational plant and equipment				
Book value	$2,282,000	$3,295,000	$4,633,000	$4,650,000
Replacement value	---	---	---	4,150,000

Table 1. Historical Data on Ashford College
1949-59
(cont'd.)

Item	1948-49	1952-53	1957-58	1958-59
Data on Budget Income				
Educational and general:				
Student fees	$ 390,790	$ 417,418	$ 611,678	$ 653,870
Endowment income	137,920	147,868	161,676	150,525
Gifts	31,057	58,643	120,667	197,652
Organized activities	19,928	21,121	23,430	27,559
Other items	4,437	4,730	25,873	56,040
Subtotal, educational, and general	$ 584,132	$ 649,780	$ 943,324	$1,085,646
Auxiliary enterprises:				
Residences	$ 71,370	$ 92,766	$ 170,349	$ 192,000
Dining halls	175,942	175,658	173,361	225,000
Student union	---	21,019	32,082	36,000
Other	---	35,957	58,965	56,000
Subtotal, auxiliary enterprises	$ 247,312	$ 325,400	$ 434,757	$ 509,000
Student aid:				
Gifts and endowment	$ 23,174	$ 31,850	$ 122,420	$ 162,244
Other allocations to student aid	4,300	20,300	54,803	68,756
Subtotal, student aid	$ 27,474	$ 52,150	$ 177,223	$ 231,000
Total income	$ 858,918	$1,027,330	$1,555,304	$1,825,646

Table 1. Historical Data on Ashford College
1949-59
(cont'd.)

Item	1948-49	1952-53	1957-58	1958-59
Data on budget expenditure				
Educational and general:				
General administration	$ 53,549	$ 63,487	$ 86,437	$ 91,557
Student services	41,771	73,210	81,199	92,121
Public services	29,574	37,031	74,040	70,980
General institutional expense	10,456	29,028	56,107	94,674
Instructional expense	271,988	322,731	440,826	520,364
Organized activities	37,443	30,652	31,239	35,991
Library	31,358	33,305	43,917	44,587
Plant operation and maintenance	115,289	136,777	163,682	1[illegible]0,631
Subtotal, educational and general	$ 591,428	$ 726,221	$ 977,447	$1,140,905
Auxiliary enterprises:				
Residences	$ 59,583	$ 95,767	$ 170,349	$ 192,000
Dining halls	148,968	151,302	173,361	225,000
Student union	1,786	21,017	32,082	36,000
Other	---	35,957	58,965	56,000
Subtotal, auxiliary enterprises	$ 210,337	$ 304,043	$ 434,757	$ 509,000
Student aid:				
Scholarships	$ 26,875	$ 53,743	$ 173,421	$ 228,533
Fellowships and prizes	440	759	3,802	2,467
Subtotal, student aid	$ 27,315	$ 54,502	$ 177,223	$ 231,000
Total expenditure	$ 829,080	$1,084,766	$1,589,427	$1,880,905

possible by the high-employment condition of our national economy and by the feeling on the part of a sufficient number of parents that private liberal arts colleges will provide a superior education for their children.

7. Salaries of college faculty members will double, on the average, nationwide, during the next five to ten years as recommended by the President's Committee on Education Beyond the High School.

8. Although there will be a growing number of Federal and state scholarships for college students, they will constitute a minor percentage of the total number of scholarships necessary for higher education. Continued solicitation by all private colleges and universities of private gifts for scholarship purposes will be necessary throughout the period.

9. Long-term loans to private colleges will be available from the Federal government, state governments, or commercial sources for the construction of dormitories, dining halls, student unions, and other revenue-producing facilities. Private gifts will be required, however, to provide funds for the construction of classrooms, laboratories, libraries and other facilities from which direct revenue is not ordinarily obtained.

The Third Step: Assumptions for the Future (the College Itself)

As the third step toward the preparation of a long-term budget, Ashford's president, dean, and business manager worked out a number of basic assumptions that would be involved in a projection for ten years ahead. They were the following:

1. The purposes and objectives of the college will remain unchanged, that is, the college will continue to provide high-quality undergraduate education in the liberal arts for young men and women of better than average academic ability.

2. Teaching methods will remain essentially unchanged except for a greater emphasis on independent study and a larger number of student teaching assistants.

3. The college calendar will remain essentially unchanged.

4. Services to students will remain essentially unchanged.

5. The college will continue to be essentially residential in character. Increases in students over the present number will have to be accompanied by an expansion of dormitory or other living quarters.

6. Enrollment will grow approximately as follows:

1957-58	759	1960-61	975
1958-59	800	1961-62	1,100
1959-60	875	1962-63 and after	1,250

7. Enrollment by 1962-63 will consist of 60 per cent men, 40 per cent women, to be arrived at as follows:

	Men, per cent	Women, per cent
1958-59	64.3	35.7
1959-60	63.0	37.0
1960-61	62.0	38.0
1961-62	61.0	39.0
1962-63 and after	60.0	40.0

8. Upperclassmen (juniors and seniors) will comprise a growing proportion of the student body, increasing from 36.8 per cent in 1958-59 to 45.0 per cent by 1962-63. This will permit the filling up of the upper-class courses which are now under-populated. It will be achieved when necessary by working with a number of junior and community colleges, expanding scholarship grants to students at such colleges, etc.

9. The ROTC program will continue at the college, enrolling the same proportionate share of men students as heretofore.

10. The teaching faculty will grow approximately as follows:

1958-59	65	1961-62	78
1959-60	67	1962-63 and after	84
1960-61	73		

This growth takes into account the filling up of the upper classes, a trend away from small sections, and the expansion of independent study for average and above-average students. (The honors students already carry on a substantial volume of independent study but at high faculty-student cost ratio.)

11. Faculty salaries will double, on the average, between 1958 and 1968. The averages arrived at for each year (after some adjusting of the scale to make the totals balance out) were as follows:

1957-58	$ 5,637	1963-64	$ 9,190
1958-59	5,997	1964-65	9,650
1959-60	6,900	1965-66	10,133
1960-61	7,390	1966-67	10,640
1961-62	8,055	1967-68	11,172
1962-63	8,753		

12. Fringe benefits for the faculty (which at Ashford include TIAA pension program, group life and health insurance, major medical insurance, and social security) will grow from 6.5 per cent of salaries in 1957-58 to 15 3/4 per cent of salaries by 1963-64 and will continue at that level.

13. Sabbatical leaves will be provided to the extent of 1½ per cent of the faculty salary budget in 1960-61; 1 3/4 per cent in 1961-62; 2 per cent in 1962-63; 2¼ per cent in 1963-64, and 2½ per cent in 1964-65 and thereafter.

14. In the future the budget for the college will be divided into four parts as follows: (a) educational and general, (b) auxiliary enterprises, (c) scholarship, and (d) plant.

Educational and General Budget

15. The educational and general budget will be balanced each year, without gifts, starting in 1962-63. It will include the following items: (a) general administration, (b) student services, (c) public service and information, (d) general institutional expense, (e) instruction, (f) organized activities related to educational departments, (g) library, (h) operation and maintenance of physical plant, (i) depreciation reserve on educational plant and (j) contingency reserve.

16. The projection of general administration expense includes allowances for the addition of one secretary in the school year 1960 and one clerk in 1961. Student services include allowances for the addition of a full-time doctor in 1961, a dean of men in 1962, and one secretary in each of the years 1961, 1962, and 1963. Public service and information includes an additional person in each of the years 1960 and 1961. Library expenditures include the addition of one professional staff member in 1961.

17. The item for depreciation of educational plant will be based on estimated replacement value of buildings as listed in Table 2. These amounts will be transferred to a special fund to be used for repairs and remodeling of the plant and to repay the endowment funds for amounts invested in the plant.

18. The item for contingencies in the educational and general budget will amount to 3 per cent of expenditures for the fiscal year 1960-61 and 5 per cent of such expenditures thereafter.

19. The educational and general budget will be financed from the following sources of income: (a) tuition and fees, (b) endowment income (unrestricted), (c) income from organized activities, (d) miscellaneous income, (e) income from

administration of auxiliary enterprises, and (f) gifts and grants as follows:

165,000 in 1959-60;
$100,000 in 1960-61;
50,000 in 1961-62.

No gift money will be allocated to this budget in 1962-63 and thereafter.

20. Starting in 1962-63, the tuition will be computed by (a) estimating the total educational and general budget; (b) subtracting from this total the estimated unrestricted income from endowment, organized activities, and the miscellaneous sources shown above; and (c) dividing the remainder by the average number of students expected for the year.

Table 2.

Year	Estimated replacement value	Amount for depreciation	Rate, per cent
1959-60	$4,200,000	$ 22,500	0.535
1960-61	4,250,000	34,500	0.811
1961-62	4,300,000	43,000	1.00
1962-63	5,600,000	70,000	1.25
1963-64	5,650,000	84,000	1.49
1964-65	5,700,000	98,000	1.72
1965-66	5,800,000	140,000	2.41
1966-67	5,800,000	140,000	2.41
1967-68	5,800,000	140,000	2.41

Auxiliary Enterprises Budget

21. The auxiliary enterprises budget will cover income and expenditure of residence halls, dining halls, student union, book store. It will be balanced in all years after: (a) transferring book store and student union profits to scholarship fund (NOTE: The book store and student union will aim to make a 5 per cent net profit on operations after payment of all costs); (b) including an administrative charge amounting to 5 per cent of total operating income to cover the supervisory time of the business manager and the record-keeping function of his office; and (c) including a charge for amortization of borrowed funds, interest, repairs, and remodeling amounting to:

5 per cent of estimated replacement value in 1959-60
6 per cent of estimated replacement value in 1960-61
7 per cent of estimated replacement value in 1961-62
7½ per cent of estimated replacement value in 1962-63
and thereafter

NOTE: An amount equivalent to this charge will be transferred each year to the Auxiliary Enterprises Reserve Fund, from which costs of amortization and other expenses will be paid in whatever year they occur. This procedure will serve to smooth out the financial effect of repairs and remodeling operations over the years.

22. Auxiliary-enterprise services will be essentially the same in the future as in 1957-58. Student living quarters will be operated as a single unit, and uniform charges will be made for all rooms. Charges will be estimated on the basis of 95 per cent occupancy.

23. Student living quarters will be expanded only as enrollment actually increases. When dormitories are financed by borrowing (either from endowment funds, government sources, or the commercial market), they will be amortized over fifty years with interest on the unpaid balance.

Scholarship Budget

24. The college's objective will be to provide a total of scholarships and wages paid to students for on-campus employment equal to 25 to 30 per cent of the college's annual income from student tuition and fees in order to assure the desired composition of the student body.

25. The scholarship budget will include amounts allowed by the college for tuition, room, and board. It will exclude compensation for student employment. This will be paid to the student out of funds appropriated to the function he performs. It will also exclude loan funds (which are created at Ashford in the first instance from gifts or from government sources). Loans are expected to be recovered ultimately by the college and to be used again on a revolving-fund basis.

26. The scholarship budget will be self-balancing. It will be financed by current gifts and endowment income specifically earmarked for scholarships, state or Federal scholarship funds, if any, and profits from the operation of the book store and student union. Inasmuch as the scholarship budget will not be financed from other sources, special efforts will be made to build up scholarship funds. Loan funds will be built up, also. An extended payment plan financed by bank credit will be worked out as soon as possible.

Plant Budget

27. The plant budget will consist of expenditures for land, buildings, and major equipment. Minor equipment will be included in the educational and general budget.

28. The plant budget will be financed entirely from endowment income earmarked for plant, current gifts for plant, special campaign gifts for plant, and long-term loans for plant, if any are desirable and available.

29. The college will raise $1,300,000 for a fine arts building and construct it in 1962. This building will permit the college to expand art, music, and drama facilities which are now inadequate. There will be no other classroom buildings constructed between 1959 and 1969.

30. Better utilization of space will make it possible to expand Ashford's enrollment from 800 to 1,250 without increasing the educational plant beyond the addition of the fine arts building. It may be necessary, however, to schedule more classes in the late afternoon and some in the evening and to put classes regularly on a forty-four- instead of a thirty-eight-hour week. (NOTE: in this connection: Five evening classes were in operation in 1958-59 for the convenience of students who preferred more daytime hours for extracurricular activities and sports.)

Endowment Funds

31. Gifts and bequests to build up endowment funds will amount to $100,000 a year. The return on endowment investments will amount to approximately 4.8 per cent of book value per year throughout the period of the projection.

32. Four per cent interest will be paid on endowment funds invested in the educational plant.

The Fourth Step: Making the Ten-year Projection

In light of:
...The historical data about the college
...The assumptions for the future of the United States economy
...The assumptions for the future of higher education, generally
...The assumptions for the future of the college
which were now on hand, Ashford's president, dean, and business manager worked out the projection of the college budget for the decade ahead. At this point, the working time required for the preliminary calculations and discussion was just about two days.

Sidney G. Tickton

The group found that the process involved making a number of initial guesses, following the trends indicated by historical figures, and then adjusting the projections subsequently in order to arrive at a proper balancing of the figures. The projections were worked out on both the income and expense side on four accounting work sheet schedules as follows:

A. Educational and general budget
B. Scholarship budget
C. Auxiliary enterprises budget
D. Plant budget

In some cases the details were not filled in; the broad picture was enough to work with. In other cases subsidiary tables were needed to assemble subtotals or additional working data. The four accounting work sheet schedules and two illustrative subsidiary tables are reproduced as an appendix to this paper. Table 3 picks up the main figures for 1959, 1963, and 1968 from the work sheets and emphasizes the four parts of the budget, each of which is balanced within itself.

A budget is a financial plan in which all the factors involved are inter-related to the extent that they involve money. Ashford's president found, in recapitulating the results, that changes in some of the critical factors in his college's future worked out as follows:

STUDENT-FACULTY RATIO

1958-59	12:1	1962-63	15:1
1960-61	13:1	1967-68	15:1

TUITION AND ROOM AND BOARD CHARGE PER STUDENT

	Tuition	Room and board	Total
1958-59	$ 817	$ 755	$1,572
1960-61	1,208	825	2,033
1962-63	1,450	875	2,325
1967-68	1,841	1,032	2,873

FACULTY COMPENSATION

	Average salary	Including fringe benefits
1958-59	$ 5,997	$ 6,470
1960-61	7,390	8,143
1962-63	8,753	10,038
1967-68	11,172	12,932

Table 3. Ten-year Budget Summary for Ashford College
(In thousands of dollars)

Expense items	1958-59	1962-63	1967-68	Income items	1958-59	1962-63	1967-68
Educational and General				Educational and General			
General administration	$ 92	$ 149	$ 168	Tuition and fees	$ 654	$1,813	$2,301
Student services	92	159	192	Endowment income	151	190	205
Public services	71	118	135	Gifts and grants	198	0	0
General institutional expense	95	102	112	Organized activities	28	34	35
Instructional expense	520	966	1,232	Miscellaneous income	56	29	32
Organized activities	36	45	48	Administration of auxiliary enterprises	0	45	60
Library	45	67	80	Operations deficit*	55	0	0
Operation and maintenance of educational plant	191	334	402				
Depreciation of reserve, educational plant	0	70	140				
Contingency	0	101	125				
Total, educational and general	$1,141	$2,111	$2,633	Total, educational and general	$1,141	$2,111	$2,633
Scholarships				Scholarships			
				Income earmarked for scholarships:			
				Book store and student union profits	$ 1	$ 9	$ 17
				Endowment	34	39	53
				Gifts	129	375	470
				Operating deficit*	67	0	0
Total, scholarships	$ 231	$ 423	$ 540	Total, scholarships	$ 231	$ 423	$ 540

Table 3. Ten-year Budget Summary for Ashford College (cont'd.)
(In thousands of dollars)

Expense items	1958-59	1962-63	1967-68	Income items	1958-59	1962-63	1967-68
Auxiliary Enterprises				Auxiliary Enterprises			
Residences and dining halls	$ 417	$ 743	$ 981	Room and board charges	$ 417	$ 743	$ 981
Book store and student union	92	152	184	Book store and student union	92	152	184
Total, auxiliary enterprises	$ 509	$ 895	$1,165	Total, auxiliary enterprises	$ 509	$ 895	$1,165
Plant				Plant			
Fine arts building	$ 0	$1,300	$ 0	Income earmarked for plant construction:			
Other buildings and grounds	50	10	50	Gifts	$ 40	$1,300	$ 40
				Endowment	10	10	10
Total, plant construction	$ 50	$1,310	$ 50	Total, plant construction	$ 50	$1,310	$ 50

*Covered by transfers from college's reserve funds.

UTILIZATION OF SPACE

	Per cent used	Basis, hours per week
1958-59	40	38
1967-68	65	44

PERCENTAGE CHANGES 1959-1968

Average tuition per student..................................	+125%
Average compensation per faculty member, including benefits....	+100%
Endowment income per student allocated to educational and general budget..	- 13%
Gifts per student allocated to educational and general budget..	-100%

Given these changes in critical factors, the necessary fund raising would be as shown in Table 4.

Table 4. Fund Raising Required
(In thousands of dollars)

Year	Educational and general budget	Scholar-ships	Endow-ments	Plant	Total
1958-59	$198	$128	$100	$ 40	$ 466
1960-61	100	285	100	40	525
1961-62	50	305	100	40	495
1962-63	0	375	100	1,300	1,775
1963-64	0	400	100	40	540
1967-68	0	470	100	40	610

Ashford's president found that the ten-year budget gave him a coordinated timetable. There was a detailed noting of actions to be taken for each segment of the college's life in each of a series of time periods. For example, the plan provided that for the school year 1962-63 as compared to 1961-62:

...The student body would increase by 150.
...The faculty would increase by six.
...The tuition and room and board would go up by $106, to $2,325.
...Faculty salary would go up by $698 to reach an average level of $8,753.
...Top faculty pay would go to $18,000.
...Fringe benefits would go up 2 per cent of pay to reach 14.7 per cent.

This meant that every decision or action taken by the board, the administration, or the faculty in 1959, and in subsequent years too, would have to be weighed against the objectives of the long-range plan. Did it fit into the plan, did it amend the plan, was it premature, or was it out of line?

The Fifth Step: What They Did about It

The ten-year budget projection set forth in summary fashion a preliminary and tentative plan for operating the college during the decade 1959-68. Although the possibilities of miscalculation were obvious, Ashford's president felt that he had, for the first time, a coordinated set of assumptions. From them he drew the following critical conclusions about the future of the college:

1. Ashford could balance its educational budget each year in the decade ahead.
2. Balancing the budget would mean that tuition would go up, but within the realm of possibility.
3. Budget balancing meant that the size of the college would grow, but not so large as to change the character of the college.
4. Budget balancing allowed for the doubling of faculty salaries, on the average, between 1958 and 1968.
5. Within this framework, Ashford could look forward to a top faculty salary of $18,000 to $20,000 within a few years, compared to $10,000 now.
6. The financial objectives could be achieved while maintaining first-class education objectives.
7. The student-teacher ratio would need to go no higher than 15:1.
8. If greater independent study were encouraged and some large lectures were introduced, the 15:1 ratio would allow adequate opportunity for all the necessary seminars and small discussion groups desired by the faculty, with a teaching load of no more than the present twelve hours per week.

In the light of these conclusions, Ashford's president submitted the ten-year budget to his trustees for discussion and study. At the succeeding annual meeting, the document was adopted as the basis of a program for action. It was clear to all, however, that the planning document would never be looked upon as a fixed, unchangeable blueprint for the next decade; it was, rather, a thoughtfully developed set of guide lines to be used in charting the course of the college's future.

One other point emerged from the meeting. The president and the trustees agreed that through the preparation and study of the long-range budget they had begun to realize for the first time how their college was really put together. They observed as they never had before:

...how a decision on one aspect of the college's activities controlled important decisions on another;
...how short-term commitments and expediency frequently determined the course of the college's long-run future;
...how the failure to consider long-range implications of today's decisions (because projections of the distant future were thought to be too speculative) could, in itself, subject the college to a host of substantial but unintended risks;
...how the mere postponing, for the time being, of a decision on a critical item could be of great and direct influence on future operating results.

They concluded that this dynamic technique could be of greatest use as a management tool only if the assumptions and figures were examined and constantly revised in the light of the social and economic changes occurring on the campus and in the country at large. They concluded also that long-range planning is a continuing job. The president put it this way:

> As our long-term objectives and our projections move toward us with time, they must be reassessed, readjusted, and re-evaluated. Meantime, of course, we must also be ready to push our projections further into the future in order to keep the guideposts visible ten or fifteen years away.

General Footnote on the Technique Described

For colleges other than the one described, it might be necessary to run through the procedure described above a number of times with alternative assumptions in order to arrive at a series of figures which would be practical and desirable at all points of the projection. A small college in the East with 300 students, for example, found that projections built around a prospective growth of 400 to 500 students by 1970 left it with either a large deficit or a salary scale that was too low. Successive projections involving 600 and then 700 students, with appropriate changes in assumptions, were necessary before the figures could be brought into balance.

For colleges other than the one described, it might also be necessary to develop detailed space-utilization projections to 1970, with estimates of number of class meetings correlated with the number of classrooms available. This would be essential, for example, at some of the city colleges where classroom space is already used from 8:00 A.M. to 10:00 P.M. five days a week and a half day on Saturday. Additional enrollments, in such cases, would require new space immediately.

There is one other point: To be most useful to college trustees (who examine college accounts and budgets rather infrequently), a long-range plan should be followed by a series of regularly scheduled progress reports. These should pick up the main figures (say, of the 1959 projection) and compare them with accomplishments in 1960 and 1961, as well as with the revised plans proposed for subsequent years. Reports of this type could well be attached to the annual budget as an appendix.

Accounting Worksheet A: Educational and General Budget 1958–63, Ashford College

Item	1957–58	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65	1965–66	1966–67	1967–68
Expense											
General administration	$ 86,437	$ 91,357	$ 116,054	$ 126,738	$ 139,960	$ 149,000	$ 153,185	$ 156,890	$ 160,575	$ 164,280	$ 167,975
Student services	81,199	92,121	97,319	121,311	145,566	159,166	165,556	172,000	178,595	185,110	191,525
Public service and information	74,040	70,980	86,443	99,750	109,460	118,175	121,500	124,800	128,200	131,550	134,900
General institutional expense	56,107	94,674	59,919	69,575	85,200	101,900	103,660	105,370	108,030	109,940	112,350
Instruction	440,826	320,364	605,598	696,828	811,960	966,056	1,021,685	1,071,862	1,122,384	1,174,655	1,231,745
Organized activity related to educational departments	31,239	35,991	39,120	41,000	42,000	45,000	45,500	46,000	46,500	47,000	47,500
Library	43,917	44,587	46,107	54,785	58,785	66,933	69,615	71,995	74,375	76,755	79,885
Operation and maintenance of physical plant	163,682	190,631	238,608	266,550	293,745	333,770	344,300	332,500	376,000	387,500	402,000
Educational plant rehabilitation and depreciation fund	0	0	22,500	34,500	43,000	70,000	84,000	98,000	140,000	140,000	140,000
Subtotal	$977,447	$1,140,905	$1,311,668	$1,311,037	$1,729,666	$2,010,002	$2,109,201	$2,199,617	$2,334,639	$2,416,790	$2,507,880
Contingency (1960–61, 3%; thereafter 5%)	0	0	29,396	45,331	86,483	100,300	105,460	109,981	116,733	120,840	125,394
Total expense	$977,447	$1,140,905	$1,341,064	$1,356,368	$1,816,149	$2,110,302	$2,214,661	$2,309,598	$2,451,392	$2,537,630	$2,633,274
Income											
Student fees	$611,678	$ 633,870	$ 910,050	$1,177,368	$1,478,149	$1,812,502	$1,905,661	$1,997,098	$2,130,392	$2,214,130	$2,301,274
Endowment income	161,676	150,325	180,737	185,000	187,000	190,000	195,000	195,000	200,000	200,000	205,000
Gifts and grants	120,667	197,652	165,000	100,000	50,000	0	0	0	0	0	0
Organized activities	23,430	27,559	27,910	30,000	32,000	34,000	34,000	35,000	35,000	35,000	35,000
Other sources	25,873	56,040	28,420	29,000	29,000	29,000	30,000	30,000	31,000	31,000	32,000
Administration of auxiliary enterprises	0	0	28,957	35,000	40,000	45,000	50,000	52,500	55,000	57,500	60,000
Total income	$943,324	$1,085,646	$1,341,064	$1,356,368	$1,816,149	$2,110,302	$2,214,661	$2,309,598	$2,451,392	$2,537,630	$2,633,274

Subschedule A-1: Budget for Instruction in Detail, 1958–68, Ashford College

Item	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65	1965–66	1966–67	1967–68
Salaries and benefits:										
Faculty salaries	$389,790	$462,337	$539,323	$628,273	$735,273	$ 772,039	$ 810,641	$ 851,173	$ 893,732	$ 938,418
Sabbatical leaves			8,093	10,995	14,705	17,371	20,266	21,279	22,143	23,460
Student assistants	7,694	10,000	14,000	16,000	20,000	21,000	22,000	23,000	24,000	25,000
Faculty benefits	30,770	37,400	54,932	78,032	107,978	121,475	127,555	133,932	139,780	147,867
Total	$428,234	$509,737	$616,348	$733,300	$877,956	$ 931,885	$ 980,462	$1,029,384	$1,079,655	$1,134,745
Departmental instructional allocation: Total	$ 30,266	$ 37,000	$ 43,000	$ 48,000	$ 30,000	$ 31,000	$ 32,000	$ 33,000	$ 34,000	$ 35,000
Other instructional expenses:										
Faculty candidates expense	$ 1,200	$ 2,000	$ 2,000	$ 3,000	$ 4,000					
Faculty research grants and publications	311	3,000	3,000	4,000	6,000					
Faculty traveling fund	1,000	1,300	1,300	2,300	4,000					
Faculty per diem travel expense	240	300	300	1,000	1,000					
Faculty seminar	10,000	10,000	0	0	0					
Miscellaneous instruction expense	1,000	1,000	1,000	1,200	1,500					
Faculty moving expense	2,700	8,000	7,000	8,000	9,000			Breakdown not estimated		
Faculty entertainment for students	100	130	130	200	300					
Chapel service expense	735	730	730	830	1,000					
Rental of Congregational church	910	910	910	910	1,000					
Adult education classes expense	0	0	0	0	0					
Duplicating	3,030	3,331	5,700	6,000	7,000					
Special grant 1	10,000	10,000	10,000	0	0					
Special grant 2	16,000	13,000	0	0	0					
Special grant 3	10,000	0	0	0	0					
Total	$ 59,416	$ 56,361	$ 32,310	$ 27,660	$ 34,800	$ 35,200	$ 35,600	$ 36,000	$ 36,500	$ 37,000
Summary:										
Salaries and benefits	$428,234	$509,737	$616,348	$733,300	$877,956	$ 931,885	$ 980,462	$1,029,384	$1,079,655	$1,134,745
Departmental instructional allocation	30,266	37,000	43,000	48,000	30,000	31,000	32,000	33,000	34,000	35,000
Other instructional expense	59,416	56,361	32,310	27,660	34,800	35,200	35,600	36,000	36,500	37,000
College examiner's office	2,428	2,481	2,730	3,000	3,300	3,600	3,800	4,000	4,500	5,000
Total	$520,364	$605,599	$694,388	$811,960	$946,056	$1,021,685	$1,071,862	$1,122,384	$1,174,655	$1,231,745

Subschedule A-2: Budget for Operation and Maintenance of Plant, in Detail, 1958–68, Ashford College

Item	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65	1965–66	1966–67	1967–68
Administration of buildings and grounds:										
Salaries	$ 10,215	$ 10,424	$ 11,400	$ 12,200	$ 13,000			Breakdown not estimated		
General expense	1,500	500	550	650	750					
Transportation and equipment	0	350	400	425	450					
Total	$ 11,715	$ 11,274	$ 12,350	$ 13,275	$ 14,200	$ 15,000	$ 15,750	$ 16,500	$ 17,250	$ 18,000
Custodians:										
Salaries	$ 59,621	$ 66,186	$ 72,500	$ 78,000	$ 92,000			Breakdown not estimated		
Student help	0	825	900	1,000	1,100					
Custodial supplies	4,300	4,000	4,400	4,700	5,000					
Laundry and cleaning	350	325	450	375	450					
Rodent and pest control	460	425	450	475	500					
Equipment and tools	0	1,100	2,000	2,100	2,200					
Campus police	730	2,200	2,300	2,600	2,700					
Total	$ 65,681	$ 75,061	$ 83,100	$ 89,250	$103,950	$106,000	$107,000	$120,000	$123,000	$127,000
Utilities and maintenance:										
Salaries	$ 11,865	$ 8,490	$ 9,300	$ 10,200	$ 11,200			Breakdown not estimated		
General utilities maintenance	4,000	2,730	3,000	4,000	5,000					
Water	1,500	1,400	1,600	1,800	2,000					
Electricity	17,600	17,300	18,000	20,000	22,000					
Equipment and tools	0	320	500	600	700					
Total	$ 34,965	$ 30,240	$ 32,400	$ 36,600	$ 40,900	$ 42,000	$ 43,000	$ 46,000	$ 48,000	$ 50,000
Heating and air conditioning:										
Salaries		$ 14,665	$ 16,000	$ 17,600	$ 18,300			Breakdown not estimated		
General maintenance expense		10,700	12,000	14,000	16,000					
Fuel for main plant	$ 19,000	22,000	23,000	24,000	25,000					
Fuel for other instructional buildings (gas)	600	1,600	1,800	2,000	2,200					
Water treatment	0	330	1,000	1,100	1,200					
Equipment and tools	0	150	300	400	500					
(Charge to Auxiliary Enterprises)	(13,800)	(13,800)	(13,800)	(13,800)	(13,800)					
Total	$ 5,800	$ 35,865	$ 40,300	$ 43,300	$ 49,400	$ 51,000	$ 52,500	$ 55,000	$ 56,500	$ 58,000
Campus maintenance:										
Salaries	$ 8,605	$ 6,515	$ 7,200	$ 8,000	$ 8,800			Breakdown not estimated		
Student help	750	750	800	1,000	1,200					
General expense and maintenance	3,450	3,400	4,000	4,500	5,000					
Arborists	2,100	2,100	2,300	2,400	2,300					
Equipment and maintenance	0	250	300	600	700					

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Trees and shrubbery:										
Planting	0	200	1.000	2,000	3.000					
Spraying	0	700	1.000	1.250	1.500					
Gas and oil	0	300	300	600	700					
Equipment and tools	0	650	2.000	3.500	5.000					
Total	$ 14.905	$ 14.865	$ 19.300	$ 23.850	$ 28.400	$ 30.000	$ 31.000	$ 32.000	$ 33.000	$ 35.000
Building maintenance:										
Salaries	$ 27.870	$ 23.330	$ 26.000	$ 28.500	$ 36.000	Breakdown not estimated				
General building maintenance	16,015	0	0	0	0					
Science hall remodeling	0	2.000	0	0	0					
Furniture and fixtures: new, repairs, and renewals	3.780	5.800	10.000	12.500	15.000					
Surplus property	100	500	1,000	1.200	1.000					
Elevator maintenance contract	0	188	200	210	220					
Equipment and tools	0	460	1.000	1.300	2.000					
Total	$ 47,765	$ 32.278	$ 38.200	$ 43.710	$ 54.220	$ 57.500	$ 60.000	$ 63.000	$ 66.000	$ 70.000
General service and trucking:										
Maintenance of equipment	$ 0	$ 1.250	$ 1.400	$ 1.450	$ 1.500	Breakdown not estimated				
Insurance on institutional plant	5.800	6.000	6.500	7.000	7.500					
General trucking	4.000	2,250	2.500	2.700	3.000					
Equipment and tools	0	200	500	600	700					
Total	$ 9.800	$ 9.700	$ 10.900	$ 11.750	$ 12.700	$ 13.000	$ 13.250	$ 13.500	$ 13.750	$ 14.000
Interest on endowment at 4%	0	29.325	30.000	30,000	30.000	30.000	30.000	30.000	30.000	30.000
Total operation and maintenance of physical plant	$190.631	$238.608	$266.550	$293.735	$333.770	$344.500	$352.500	$376.000	$387.500	$402.000

Accounting Worksheet B: Scholarship Budget, 1958–68, Ashford College

Item	1957–58	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65	1965–66	1966–67	1967–68
Income for scholarships:											
Endowment	$ 32,213	$ 33,805	$ 34,000	$ 34,000	$ 37,000	$ 39,000	$ 41,000	$ 44,000	$ 47,000	$ 50,000	$ 53,000
Gift	90,207	128,439	274,000	285,000	305,000	375,000	400,000	430,000	450,000	460,000	470,000
Book store and student union	300	1,390	3,000	5,000	8,000	9,000	9,000	11,000	13,000	15,000	17,000
General college funds	54,503	67,366	0	0	0	0	0	0	0	0	0
Total	$177,223	$231,000	$311,000	$324,000	$350,000	$423,000	$450,000	$485,000	$510,000	$525,000	$540,000
Expenditures for scholarships	$177,223	$231,000	$311,000	$324,000	$350,000	$423,000	$450,000	$485,000	$510,000	$525,000	$540,000
Expenditures for student employment on campus	$ 37,317	$ 40,566	$ 45,000	$ 50,000	$ 55,000	$ 62,000	$ 65,000	$ 65,000	$ 70,000	$ 75,000	$ 80,000
Scholarship expenditures and student employment expenditures together:											
Amount	$214,540	$271,566	$356,000	$374,000	$405,000	$485,000	$515,000	$550,000	$580,000	$600,000	$620,000
Portion of tuition income, per cent	35	42	39	33	27	26	27	27	27	27	27

Accounting Worksheet C: Auxiliary Enterprises Budget, 1958–68, Ashford College

Item	1957–58	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65	1965–66	1966–67	1967–68
Factors entering into auxiliary enterprises budget											
Enrollment:											
Total	739	800	875	975	1,100	1,250	1,250	1,250	1,250	1,250	1,250
To house in dormitories	538	536	650	730	730	756	790	790	868	903	950
To feed in dining halls	433	530	630	680	780	920	950	950	950	950	950
Room charge	$ 305	$ 345	$ 350	$ 365	$ 400	$ 400	$ 400	$ 450	$ 470	$ 485	$ 492
Board charge	400	410	430	460	475	475	500	525	530	535	540
Total	$ 705	$ 755	$ 780	$ 825	$ 875	$ 875	$ 900	$ 975	$ 1,000	$ 1,020	$ 1,032
Income from auxiliaries											
Room and board	$343,710	$417,000	$498,500	$580,000	$661,500	$743,000	$799,333	$ 855,666	$ 912,000	$ 946,500	$ 981,000
Other	91,047	92,000	107,000	122,000	137,000	152,000	158,000	164,000	170,000	177,000	184,000
Total income	$434,757	$509,000	$605,500	$702,000	$798,500	$895,000	$957,333	$1,019,666	$1,082,000	$1,123,500	$1,165,000
*Expenditures for auxiliaries**											
Residence halls	$170,349	$192,000	$227,500	$267,000	$292,000	$305,000	$320,000	$ 355,666	$ 408,000	$ 438,500	$ 468,000
Dining halls	173,361	225,000	271,000	313,000	369,500	438,000	479,333	500,000	504,000	508,000	513,000
Other	91,047	92,000	107,000	122,000	137,000	152,000	158,000	164,000	170,000	177,000	184,000
Total expenditures	$434,757	$509,000	$605,500	$702,000	$798,500	$895,000	$957,333	$1,019,666	$1,082,000	$1,123,500	$1,165,000

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* Includes charge for amortization of borrowed funds, interest, repairs and remodeling, an amount equivalent to which is transferred each year to the Auxiliary Enterprises Reserve Fund; includes also administrative charge equal to 5 per cent of operating income; includes also charge equal to book-store and student union profits which are transferred to scholarship funds.

Accounting Worksheet D: Plant Budget, 1958–68, Ashford College

Item	1957–58	1958–59	1959–60	1960–61	1961–62	1962–63	1963–64	1964–65	1965–66	1966–67	1967–68
Source of Funds											
Gifts:											
Regular	$30,000	$40,000	$40,000	$40,000	$40,000	0	$40,000	$40,000	$40,000	$40,000	$40,000
Special campaign		0	0	0		$1,300,000					
Endowment income	8,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Total income	$38,000	$50,000	$50,000	$50,000	$50,000	$1,310,000	$50,000	$50,000	$50,000	$50,000	$50,000
Expenditures											
Fine arts building	0	0	0	0	0	$1,300,000					
Other land and buildings	$38,000	$50,000	$50,000	$50,000	$50,000	10,000	$50,000	$50,000	$50,000	$50,000	$50,000
Total expenditures	$38,000	$50,000	$50,000	$50,000	$50,000	$1,310,000	$50,000	$50,000	$50,000	$50,000	$50,000

NOTE: Fund raising or construction could be shifted from one year to another if necessary.

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Program

XI. The Analysis of Class Size, Teaching Load and Instructional Salary Costs

. . . . James I. Doi

The topic for discussion today deals with one of the oldest concerns of the teacher. It stems from the fact that a person, in order to be a teacher, must have students. A man may possess knowledge--knowledge about many things in general or much about some small aspect of life or his environment. But from ancient times it has been recognized that the distinguishing mark of a teacher is that he has students or disciples--persons who are willing to come to him and learn from him. In our day this definition still holds--even though many students sit before their teachers because the law requires them to or because a course is required.

Although the terms "course offerings," "class size," "teaching loads," and "instructional costs" may not occur in the writings of ancient teachers and descriptions of their activities, one can find numerous references to such matters as the number of disciples who gathered about a great teacher on a given occasion (which in today's parlance we might call a class), the subject matter of his discourse (which we would call a course), and admonitions to the effect that no teacher, no matter how great, should attempt to lecture on every subject known to man (which today we would refer to as scope of subject-matter covered by a faculty member).

Certainly the teacher in the Medieval universities was much concerned about the size of his classes since his pay was usually related to the number of students who came to him. You will recall the origin of the pocket-like fold of the hood--that part of the formal academic attire worn by faculty members during academic ceremonies. This pocket-like fold hangs behind the wearer. During Medieval times, the Master collected his fees directly from his student; the pocket-like fold was to permit his students to reward the Master for his services in such a manner as to avoid the embarrassment of direct hand to hand transfer of money.

Because this concern with class size and teaching load has been with the teacher for such a long time, I wish it were possible to say to you today that modern institutional research has solved all the problems and we can present you with all the answers. I have no such message to give you.

What I have to discuss deals mainly with how wise presidents, wise deans, and wise faculty members might go about gathering and analyzing data that can help them effect greater economy and efficiency in the management of instructional programs. I stress wise presidents, wise deans, and wise faculty members because no set of data, however detailed and conscientiously gathered and tabulated, can replace the element of good judgment. Institutional research, as you should have already surmised by now, is not a panacea for the assorted ills of higher education.

Uses of Faculty Work Load and Instructional Cost Studies

Of what use are studies of faculty work load and instructional costs to those concerned with the conduct of the instructional program? Such studies can serve the following purposes:

1. To provide information that will assist faculty groups and administrative officers in assessing the general efficiency and economy of the instructional programs. The same information can also be used to answer questions pertaining to the conduct of instructional programs raised by regents, legislators, and others concerned with the support of higher education.

2. To provide information that will assist in the development of objective criteria of instructional loads and staffing needs. A favorite pastime of faculty members is to compare teaching loads, the general thesis being that they are terribly overloaded, that classes are too large, and that there are too many classes to teach. The use of data can help put this kind of faculty talk on a more objective basis, freeing department heads and deans of endless hours of debate as to whether or not a particular department is understaffed or whether or not a particular faculty member has a heavier teaching assignment than certain of his colleagues.

3. To stimulate experimentation with instructional techniques and various class sizes. It is not unusual for faculty members to get into a rut and teach their classes by the same methods and by the same size groups year after year. The thought that they might even lighten their teaching loads by more efficient scheduling of courses and class sections may not occur to them, or if such a thought does occur to them, they don't quite know exactly how to approach the problem. In the hands of imaginative deans and department heads, faculty work load data can stimulate such groups into action and pave the way for experimentation with more efficient forms of instruction and utilization of faculty manpower.

4. To provide information for the planning of future expansion and changes in instructional programs and in plant facilities. Especially useful for this purpose are data showing the distribution of teaching loads and student credit hours at the undergraduate and graduate levels

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and among various subject fields. When gathered over a period of successive years, such data come to have added significance.

It should be noted that no mention has been made of the relevance of these data to the quality of instructional programs or to the nature of interaction between teacher and student in a classroom. These are certainly proper subject matter for institutional research, but the kinds of analysis which constitute the topic of this discussion do not directly measure either quality of instruction or the nature of teacher-student interaction.

Basic Types of Faculty Work Load and Instructional Cost Studies

Studies of faculty work load generally fall into two categories--(a) those that deal with "total service load" and (b) those confined to "teaching (or instructional) load," narrowly defined.

In practically all institutions of higher education, faculty members do a great deal more than prepare for and meet classes. They devote their time and energies to research, student counseling, departmental and institutional administrative affairs, community and public service, professional organizations, in addition to class instruction. It is in studies of "total service load" that an attempt is made to take into account all of these activities. In a study of "total service load" of the faculty of the University of Colorado, made several years ago, it was found that, on the average, faculty members devoted 60 per cent of their time to teaching duties, which included time spent on preparation for class work and in classrooms, and 40 per cent to more than half a dozen other functions.

Studies of "teaching (or instructional) load" are generally confined to certain measurable aspects of class instruction, such as credit hours of classes taught, student-credit-hours taught, or number of class contact hours. Time devoted to the preparation of classes is rarely included in studies of "teaching load." It is for this reason that I used the term "narrowly defined" to describe this type of load study.

Another important distinction between studies of "total service load" and of "teaching load" is that the "total service load" study necessitates a questionnaire to individual faculty members, in which they are asked how many hours, on the average, each working week they spent on class preparation, class meetings, committee assignments, and various other activities. The "teaching load" type of study is based on data that are, in reasonably well-managed institutions, a matter of record in the office of the registrar or in the office of the dean of faculty. Because the required data are readily available, studies of "teaching load" can be made more frequently and with less wear and tear on faculty members.

Studies of instructional costs can also be classified into two categories--(a) those that are limited only to salaries paid persons who actually taught a class or classes during a given term or year; and (b) those that attempt to take into account not only salaries for teaching but also expenditures for instructional supplies, faculty benefits, secretarial and clerical services for faculty members, and for other items directly related to the function of instruction. Studies in the first category include only one kind of expenditures, salaries for teaching. For this reason they are frequently described as studies of "instructional salary costs."

Studies in the second category tend to vary somewhat in the kinds of expenditures included or excluded. These variations usually reflect differences of opinion among college and university budget officers as to the kinds of expenditure items that properly belong in the budget for an instructional department. For example, the costs of retirement provisions at some institutions are either prorated or charged directly to each department of instruction; at other institutions, they are classified as a general institutional expense. As another example, funds for faculty travel at some institutions are prorated or charged to each department of instruction; at others, they are classified as a form of administrative expense.

Studies of instructional costs should be distinguished from studies of total expenditures for educational and general purposes. The latter type of study includes expenditures not only for instruction, but also for administrative purposes, general institutional purposes, libraries and museums, plant operation and maintenance, organized research, general extension, and organized activities related to instruction. Occasionally one finds a study in which two categories of instructional costs are used--"direct costs" and "indirect costs." The "indirect costs" usually consist of expenditures for such functions as administration, plant operation and maintenance, libraries, etc., prorated to each instructional department by some formula.

In describing the major types of studies of faculty load and instructional costs, I have avoided categorizing one type of study as being superior or more useful than another. The truth of the matter is that each of the major types of studies mentioned yields different kinds of measures of load and costs and, thus, each contributes to a more complete understanding of an institution. Institutions should study both "teaching load" and "total service load," in order to obtain as complete a picture as possible of the utilization of faculty manpower; and it should make studies of instructional salary costs, of all instructional costs, and of educational and general expenditures, in order to determine the costs of various programs and functions and to devise ways and means of making the best use of available funds.

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THE ANALYSIS OF TEACHING LOAD AND INSTRUCTIONAL SALARY COSTS

The remainder of this discussion will deal with the terms and techniques involved in a particular type of study of teaching loads (narrowly defined) and instructional salary costs. A chief architect of this type of analysis is Dr. John Dale Russell who, over a period of many years developed, or helped develop, many of the concepts and techniques involved. Some of you are undoubtedly familiar with the recent Russell reports on instructional programs for the New Mexico and Michigan institutions of higher education. Much the same techniques were applied in the analyses of instructional programs for the 1956 study of higher education in Florida, the 1955 restudy of the needs of California higher education, the current study of Texas higher education by the Texas Commission on Higher Education, the 1958 Homer Durham study of Montana higher education, and the study of Colorado colleges and universities. The analyses of instructional programs made for the institutions of higher education in these states are mentioned because the resulting data were published. Institutions in a number of other states have made similar analyses, but, for the most part, the results have not been made available to persons outside of the institutions, except on a personal and confidential basis.

Some forms used in collecting the required data are in Appendix A of this volume. Included with these forms is a set of instructions. These forms are being used for the study of class size, teaching loads, and instructional salary costs, for the academic year 1958-59, by the Colorado state-supported institutions of higher education. They are very similar to those used by Dr. Russell in his studies of the New Mexico and the Michigan institutions. The forms, especially the worksheets illustrating how to classify and tabulate the data, are intended for manual processing of data. The entire analysis can also be done by machine.

The following section on definition of terms has been reproduced from an unpublished study of instructional programs for New York University, made recently by Dr. John Dale Russell. This particular set of definitions is not only the most recent but the most comprehensive, and I have asked him to share it with us. I do recommend, however, that you examine his published study entitled Instructional Programs in Michigan Institutions of Higher Education, Staff Study No. 6, of the Michigan Survey of Higher Education, which also contains a thorough statement of the terms and procedures involved in the particular type of instructional program analysis under discussion here.

For reasons which require little explanation, I have omitted from Dr. Russell's statement specific references to New York University. I have also added an occasional remark, and these can be readily identified.

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The terms fall into four broad categories: (I) certain *unit measures* that are used in reporting the instructional program; (II) *basic factors* that are used in the classification of the data; (III) *program factors* that are used to give a quantitative expression to the instructional service of the institution; and (IV) terms that reflect *relationships* between the various program factors.

I. Unit Measures Used

1. *The course* is an area of subject-matter, always identified by a descriptive title and usually identified by a distinctive course number and departmental designation. It may be presumed that, except as otherwise noted, every course comprises a unique configuration of subject-matter and has a minimum of overlapping of content with other courses. Sometimes a course is given double numbering, with respect to departmental classification, to show that it may be applicable to the interests of students in two departments rather than one. Thus the course "Classics 3, The Art of the Greeks" may carry the catalog notation "Course identical with Fine Arts 3." The published catalog usually provides a brief description of the content of each course, in addition to its title, department, and number. In the present analysis, courses that carry numbers or other cross-referencing in more than one department are classified only in the one department in which their listing is considered to be primary.

2. *A class* is a group of students meeting at the same time and place under an instructor for the pursuit of a course. The "class" differs from the "course" in that the "class" is a grouping of persons while the "course" is an organization of subject-matter around some central theme or topic. A course may be given in several duplicate sections, with class groups meeting at different hours during the day and on different days of the week and under different instructors. Each such duplicate section of a course constitutes a separate class for the purposes of the present analysis.

3. *The credit-hour* is the measure used to indicate the extent of the content of a course. The credit-hour is also one of the measures used to express the quantitative requirements for a degree. Each class is assigned the same credit-hour value as that of the course for which the class is given. A course is normally given for a fixed number of credit-hours or points, though the credit-hour value of a given course may be changed from time to time. Courses vary in their credit-hour values. The great majority of the courses carry 2, 3, or 4 credits, but there are some one-credit courses and a number that carry more than 4 credits. Because of this variation in the credit-hour value of courses, the course itself cannot be used for a precise count of the extent of the subject-matter offerings, so the credit-hour must be used for this purpose.

Classes of the recitation and lecture type usually carry as many credit-hours or points as the number of hours of class meetings during one week of a semester. Courses of the laboratory or shop type usually meet for two or more hours each week for a semester, for each credit-hour carried. It should be noted that in the present study no measure is used to report "contact hours" (the number of hours the instructor devotes to class meetings of all types per week). All tabulations in this study are in terms of "credit-hours" and not in terms of "contact hours."

The "credit-hour" must always be designated as to whether it is a "semester" hour (in institutions operating on a semester basis) or a "quarter" hour (in institutions operating on a three-term or quarter basis during the academic year). Quarter-hours may be converted to semester-hours by using the formula: three quarter-hours equal two semester-hours.

4. *The student-credit-hour* is a measure of instructional production. The unit is one student in a one-credit-hour course. Thus a three-credit-hour course with 30 students enrolled produces 90 student-credit-hours.

5. *The full-time-equivalent member of the instructional staff* is the measure used to indicate the effort put into the instructional program by the faculty. For the purposes of this study, "faculty member" or "member of the instructional staff" means someone who has primary responsibility for the teaching of one or more classes. The test is the submission of the grade-report for the class; anyone who submits a grade-report is considered a "member of the instructional staff" in this study. The unit used in counting this item is defined as a member of the University faculty on a full-time basis whose only specifically assigned duties are the teaching of classes and the other activities of a regular member of the faculty that are normally associated with the teaching function. Persons who are part-time members of the university staff are included at the appropriate percentage of their full time. Members of the full-time faculty who are definitely assigned for part of their time to other duties, such as research projects or general university administration, are also counted at the proper percentage of full-time. The official budget of the university was used as a basis for determining the percentage of full-time that should be assigned to each staff member who is not on full-time teaching service. Assignment of duties as head of a department was not considered as a subtraction from full-time instructional service, inasmuch as this is a necessary and direct part of the instructional function itself.

6. *Salary expenditures for instructional staff members* are expressed in dollars of salary for the nine-months academic year or such part of that year as the faculty member may have served. The figures for salaries are taken directly from the budgets. The full-time salary of a member of the university staff who devoted only a part of his time to instruction is fractioned in accordance with the percentage of full-time that the staff member devoted to instruction, and that portion of his salary is assigned as the salary for his instructional

service. For example, if the budget indicated that a given faculty member was to devote one-third of his time to research and two-thirds to instruction, then two-thirds of his salary was considered as the salary expenditure for instructional service. In the case of personnel who give only part of their time to university service, i.e., those who are employed to teach one or two courses, the indication in the budget or the appointment records was followed if there was any notation regarding the fraction of full-time service that was appropriate; if there was no such indication, the person was arbitrarily assigned that percentage of full-time represented by the percentage that the number of his credit-hours of teaching was of the normal number of credit-hours taught by a full-time instructor in the School or College in which his service was rendered.

In the following section, Dr. Russell discusses six factors that can be used for the classification of instructional program data. These factors are especially pertinent to the analysis of instructional programs of a complex, university-type institution. It should be noted that in studies involving two or more institutions, we ordinarily use only two of the six factors--subject-matter classification and academic level.

II. Basic Factors for Classification of Data

7. The School or College is the basic organizational unit of the university, and the major budgetary unit within the academic program. All the data of this study are classified in accordance with the School or College primarily responsible for the offering of the courses. Courses that are listed in two or more School or College catalogs are assigned to the unit that is indicated as having the primary responsibility. Faculty time and salaries are assigned according to the School or College responsible for the course or courses taught. In practically all cases, the budgetary assignment of the instructor to a School or College is the same as that of the courses he teaches. In the case of a faculty member teaching in two different Schools or Colleges, his time and salary are fractioned in accordance with the budget, and if there is no indication in the budget, the fractioning is done in accordance with the credit-hours of class teaching in each School or College.

8. The department is a sub-unit of organization within the School or College. The analysis in this study follows the organizational pattern in each of the several Schools and Colleges. Each of the Schools and Colleges has its own unique pattern of departmental organization, and the patterns are by no means identical even in the several Schools or Colleges that deal with the same broad classification of subject matter, such as the liberal arts.

9. The subject-matter classification of each course refers to the specific field of content into which the course seems to fall, regardless of the School or College or department in which it is given. This classification attempts to put together the courses that seem to belong to the same subject-matter family, though possibly taught in different Schools or Colleges and in different departments.

The general policy, in the development of the list of subject-matter areas, was to set up units that would be comparable among the various Schools and Colleges. Each foreign language, for example, is considered as a separate subject-matter field, even though the departmental organization may group several different languages into one Department, such as the Department of Romance Languages. In the case of foreign languages, only courses taught in the language itself are classified under the subject-matter heading of the particular language; courses taught in English translation are classified as, e.g., English, or literature, or as classical civilization, depending on the nature of the course.

Because of differences between the subject-matter classification and the departmental structure, the courses of a given department may appear under more than one subject-matter head. Thus "statistics" is used as a subject-matter category, so courses on statistics that are taught in Departments of Mathematics, Education, Economics, Sociology, Government, or Industrial and Management Engineering, are not included under the subjects represented by the departmental names but under the classification labelled "statistics." This plan is used in order to permit comparisons between and among the various Schools and Colleges in which courses in a given subject-matter field may be offered.

10. The academic level of a course signifies the general maturity of the students for whom it is intended. Throughout the country it has been customary to recognize three different academic levels: (1) the first two college years, or the "lower division" of the undergraduate program; (2) the second two years, or the "upper division" of the undergraduate program; and (3) the graduate program.

As in other comparable studies of this sort, the classification of courses on the graduate level was rather strictly defined, to include courses normally open only to graduate students. All courses in Schools that have the word "Graduate" in their title--Graduate School of Arts and Sciences, Graduate School of Business Administration, and Graduate School of Public Administration and Social Service--were considered to be solely and strictly of graduate level. All courses in the Law School were also classified as strictly graduate level.

11. The tenure status of the members of the instructional staff was also used as a basic factor in the classification of the data of this study. Each member of the instructional staff was classified as "tenure" or "non-tenure." The data on tenure status were taken from the budget records. The data with respect to tenure status of faculty were analyzed only within the broad classification of School or College; further analysis by departmental sub-unit or by subject-matter area was not attempted in the tabulations, though such data could be tabulated from the available punched cards if needed.

12. *The academic rank* of the member of the instructional staff was entered on the punched card for each class, but no tabulations have been made on this factor.

III. *Program Factors*

Six types of statistical data are used in the present study to describe the instructional programs in the various Schools and Colleges, departments, subject-matter fields, and academic levels. Each of these will be defined in the paragraphs that follow.

13. *The number of credit-hours of different courses offered* is a measure of the scope of the program of instruction that is made available. Each course with an individual title and course number is counted as a separate course, and summations of the "different courses" are expressed in terms of the number of credit-hours for which each was given. Each course in such a tabulation is counted only once, no matter how many times during the year it was given or how many sections of the course were taught each semester. Two separate counts were made of the credit-hours of different courses offered; one based on the *catalog* listings of courses and the other based on the Registrar's list of courses *actually* taught. The difference between these two counts indicates the extent to which the catalog "over-advertises" (or in some cases, under-advertises) the course offerings. The tabulations in the series that are headed "number of credit-hours of different courses actually taught" refer to the data taken from the Registrar's listings of classes taught.

In the computation of credit-hours of different courses offered, it is assumed that the courses in each School or College are "different" from all the courses in any other School or College. Thus the gross totals for the entire university are not adjusted to account for the fact that certain courses, which are probably very similar if not identical (for example, beginning foreign language or freshman English composition), are taught in various Schools or Colleges.

14. *The number of credit-hours of classes taught* is a measure of the "in-put" of instructional effort by the faculty. This measure differs from the preceding one, described in paragraph 13, in that in the former case the credit-value of the "course" is counted only once, regardless of the number of times the course was given during the year; while in the latter measure, credit-hours of classes taught, the count includes a separate credit-hour value for *each* class in which the course was taught during the year. Thus, the three-credit course in first-semester English composition for freshmen in a given School or College counts only as 3 in the tabulation of different courses offered; but if twenty sections of this one course are maintained during the year, the count would be 3 times 20, or 60 credit-hours of classes taught.

15. *The number of student-credit-hours produced* is the sum of the products of the number of students in each class times the number of

credits for which the class is given. Thus, a class of 35 students in a three-credit course and a class of 40 students in a four-credit course together produce 265 student-credit-hours (35 x 3 + 40 x 4). The number of student-credit-hours is the best single statistical measure for describing the "out-put" or the "production" of the instructional program.

16. The number of full-time-equivalent members of the instructional staff is the sum of the percentages of full-time devoted to a particular unit or area by the faculty members teaching in that unit or area. As indicated earlier, this factor measures the "in-put" of instructional effort. In some of the smaller categories in which the data of this study are reported, the number of full-time-equivalent members of the instructional staff is less than one, because faculty members may divide their time between different academic levels or different subject-matter areas or different departments. In all cases in which the number of full-time faculty members is less than one the data based on that measure must be interpreted cautiously.

17. The total expenditures for salaries of members of the instructional staff is the sum of the dollar amounts of instructional salaries allocated to the particular School or College, department, subject-matter area, or academic level.

18. The number of credit-hours of classes taught in small classes has been tabulated for each subject-matter category, and each academic level. Two categories of "smallness" have been used: (1) classes with fewer than 5 students (i.e., with 4 or fewer students enrolled); (2) classes with fewer than 10 students (i.e., with 9 or fewer students enrolled). The grouping of classes with fewer than 10 students includes the classes with fewer than 5 students. In each case the count is in terms of the number of credit hours for which the small classes are given.

IV. Relations between Program Factors

In order to make comparisons between the gross amounts shown for each of the program factors among the various Schools and Colleges, departments, subject-matter areas, academic levels, etc., it is necessary to reduce the gross amounts to common denominators by an analysis that involves certain inter-relations of program factors. Some seven of these inter-relationships have been calculated and are reported in the present study.

19. The weighted average size of classes taught shows the average number of students in classes, as reported by the Registrar, for each grouping in which the program is analyzed. The average is "weighted" by the number of credit-hours each course carries. For example, to take a simple illustration, if in a particular classification there is a one-credit course enrolling 60 students and a five-credit course enrolling 6 students, the unweighted average size of the two classes would be 60 + 6 ÷ 2, or 33, but the weighted average size of the two classes would be (60 x 1) + (6 x 5) ÷ 1 + 5, or 15. As can be noted from

the example here used, the weighted average size of class can be derived by dividing the total number of student-credit-hours produced by the total number of credit-hours of classes taught (item 15 in the preceding section divided by item 14).

20. The percentage of classes that are small relates the number of small classes to the total size of the instructional program, by dividing the number of credit-hours of classes that are small by the total number of credit-hours of classes taught (item 18 in the preceding section divided by item 14, the quotient being multiplied by 100 to convert to percentage). The percentage of classes that are small is shown for both the classes enrolling fewer than 5 students and for those enrolling fewer than 10 students.

The data on percentage of classes that are small should be a useful starting point for a review of the instructional program in the interest of improving its efficiency. Often the maintenance of too many small classes, especially at the undergraduate level, is associated with an over-expanded scope of course offerings, as reflected in the data on number of credit-hours of different courses taught. The maintenance of some small classes is less objectionable if accompanied by a relatively large average size of class than it is if the average size of class is also small. In general, the continued maintenance of a course in which the classes are small, year after year, needs to be justified in terms of some special contribution that the course makes to the curriculum or the services of the university.

21. Student-credit-hours produced per full-time-equivalent member of the instructional staff, for any grouping of courses, is obtained by dividing the total number of student-credit-hours produced by the number of full-time-equivalent members of the instructional staff (item 15 divided by item 16). This measure relates "in-put" to "out-put" and is therefore probably the best single index of the efficiency of the instructional program.

22. The average credit-hours of teaching per full-time-equivalent member of the instructional staff for any grouping of courses is obtained by dividing the "total number of credit-hours of classes taught" by "the number of full-time-equivalent members of the instructional staff" (item 14 divided by item 16). It should be noted that the measure deals with credit-hours of classes taught per academic year (two semesters) by the instructor, rather than with contact hours, or the number of hours the instructor met classes. Thus the measure does not give any different recognition to recitation-type courses and laboratory-type courses, though in the latter type of course the instructor may spend two or more hours with the class for each hour of credit the course carries. Nor does this measure give recognition to the fact that in certain graduate-level programs the instructor in a three-credit course meets the class for only two hours per week.

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In general, it is considered wise academic administration to keep the number of credit-hours of teaching as low as possible, so that faculty members may have the maximum opportunity for scholarly activities other than class teaching. When this principle is combined with the one suggested in the preceding paragraph, it appears that a well administered and efficient academic program tends to keep the average credit-hours of teaching per faculty member low and the average student-credit-hours produced per faculty member high. The attainment of these goals is made possible by keeping the average size of classes relatively large. Thus, a given total instructional burden, say 12,000 student-credit-hours, could be carried by 20 full-time-equivalent faculty members teaching an average of 24 credit-hours per year with an average size of class of 25; the same number of faculty members could carry this same instructional burden by teaching an average of 20 credit-hours a year with an average size of class of 30.

23. The average instructional salary expenditure per full-time-equivalent member of the instructional staff is obtained by dividing "the total instructional salary expenditures" by "the number of full-time-equivalent members of the instructional staff" (item 17 divided by item 16). This average indicates the extent to which the faculty members receive salary compensation for their instructional services. By and large, this is probably one of the best measures available to indicate the quality of an instructional program. It may be presumed that there is a wise administration of the available funds to obtain the best possible instructional personnel for the levels of salary that can be offered, so the higher the average salary the better the quality of the instructional staff.

It can readily be shown, by simple arithmetic, that with a given amount of money for instructional salaries and a given number of student-credit-hours produced, the average faculty salary varies directly with the number of student-credit-hours produced per member of the instructional staff. If, in the illustration used in the preceding paragraph, there is a faculty salary budget of $132,000 to support the instructional program in which 12,000 student-credit-hours are produced, and if 20 full-time-equivalent faculty members are employed for this service, the average student-credit-hour production would be 600 per faculty member and the average salary would be $6,600. If, on the one hand, the average student-credit-hour production could be pushed up to 750 per full-time-equivalent instructor, only 16 instructors would be required and the average faculty salary could be $8,250. If, on the other hand, the student-credit-hour production is only 480 per full-time-equivalent faculty member, then 25 faculty members would have to be employed and the average salary could be only $5,280.

In other words, in order to maintain a high average faculty salary (and therefore an instructional staff of high quality), it is desirable, under conditions of a limited budget for faculty salaries, to push up the average student-credit-hour production per member of the instructional staff. This is accomplished by avoiding the use of more faculty members than are absolutely necessary to staff a satisfactory instructional program. There is no evidence, within the normally observed range of student-credit-hour production per member of the instructional staff, that any deterioration occurs in the quality of the instructional service as the number of student-credit-hours produced per faculty member increases.

24. The average instructional salary expenditure per student-credit-hours produced is obtained for any grouping of courses by dividing the total instructional salary expenditure by the number of student-credit-hours produced (item 17 divided by item 1). This is a very simple cost figure. It must be interpreted with caution because instructional salaries are by no means the total cost that devolves upon the university in the production of student-credit-hours. Care must also be taken when interpreting this cost figure, because it is a composite of the number of student-credit-hours produced per faculty member and the average salary per faculty member.

A high cost per-student-credit hour is commendable if it is caused by the utilization of a staff of excellent quality at high salaries. The opposite conclusion must be drawn if the high cost per student-credit-hour is primarily attributable to a low student-credit-hour production per faculty member.

Cost data similar to the one here defined are used in industry and commerce for two purposes: (1) to assist in determining the selling price of a product; and (2) to eliminate from the line of goods produced or services rendered those kinds of units or services that cannot be produced at a cost below the price at which they can be sold. Neither of these uses of the cost data is entirely applicable to an educational institution. In general it is not the policy of colleges and universities to fix their prices (i.e., fees charged students) for each course or group of courses in accordance with the cost of teaching each course. And in almost every college or university it is necessary, in the maintenance of a well rounded curriculum, to teach some courses that have a much higher cost of production than others. Caution must therefore be raised against the use of the data on instructional salary expenditure per student-credit-hour as a device for arbitrarily eliminating certain courses or curriculums from the academic program of the university. The data present one factor which might well be taken into account in such a decision, but the cost data alone should not be finally determinative.

25. The average instructional salary expenditure per credit-hour of classes taught is obtained for any grouping of courses by dividing the total expenditure for instructional salaries by the number of credit-hours of classes taught (item 17 divided by item 14). This measure may be interpreted as the average cost of maintaining a one-credit-hour class in the grouping of courses for which the data are presented....

Collecting the Data

In Appendix A you will find forms and instructions used by the state-supported institutions in Colorado for collecting data on class size, teaching load, and instructional salary costs.

It is important that department heads and others who complete these forms be given accurate and complete instructions and definitions so that comparable data will be obtained.

These forms and instructions can be adapted to the special needs and programs of most colleges and universities.

Analyzing the Data

Earlier in this paper there are a number of comments on the kinds of analyses that can be made of instructional salary cost data. The comments under "Program Factors" and "Relations Between Program Factors" (terms number 13 through 25, above) should suggest a number of ways of analyzing these data.

And, for illustrative purposes, we have reproduced in Appendix A a number of tables of data on the New Mexico institutions of higher education.

These tables, together with Raymond Kettler's remarks in the following chapter, should provide you with a rather complete overview of the subject of instructional costs.

In conclusion, let me remind you that this paper has emphasized the analysis of instructional salary costs (not total instructional costs) on the basis of teaching load (not on the basis of total faculty work load). In the following chapter, Mr. Kettler will discuss the second type of analysis; namely, total instructional costs, on the basis of an analysis of total faculty work load.

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XII. The Analysis of Class Size, Teaching Load and Instructional Costs

. . . . **Raymond W. Kettler**

In the preceeding chapter, Dr. Doi has described techniques for analyzing instructional salary costs on the basis of teaching load. In this chapter, after some remarks on the historical development of this kind of analysis, I will describe methods of studying total instructional costs, on the basis of data on total faculty work load.

The Need for Analysis of Factors Affecting Instructional Costs

During the past quarter century, total annual expenditures for educational and general purposes of all institutions of higher education increased by at least 60 per cent. In the decade ahead, these expenditures may double or even treble, and thus may approach ten billion dollars a year. About 50 per cent, or five billion dollars, of this amount may be expended for instruction and departmental research. In some institutions an even greater percentage will be expended for this purpose.

These figures are no longer as startling as they were a few years ago. Actually, it is likely that they may be quite conservative. However, further inflation and advances in knowledge requiring new facilities and more costly supplies and equipment may multiply expenditures far beyond that which we presently foresee.

As total expenditures for instruction and departmental research increase, it will become more necessary to analyze factors affecting these costs. Every effort must be made to effect maximum economy, not to save dollars, but to be certain that the total resources available for higher education are used most wisely. Unless this is done, we shall fail to provide the educational opportunities that will be demanded. Since so large a percentage of the operating dollar is used for instruction and research, this area provides an unusually fertile field for careful analysis of the factors affecting these costs.

In addition to our own desire to use effectively the funds available for higher education in order to assure maximum educational opportunity, those who support higher education, both privately and publicly controlled, are becoming increasingly insistent, and properly so, that specific evidence be provided which will give assurance of maximum utilization of resources. The absence of a profit and loss statement can no longer be used as an excuse for failure to provide adequate analyses of costs. A mere statement of beginning balances, income by source, expenditures by function or object, and ending balances is no longer sufficient. Questions are raised on every hand as to how the money was actually used.

Friends and alumni of privately controlled institutions, industry, foundations and individual philanthropists are asking questions regarding costs in institutions in which they have an interest. Public agencies at the local, state or federal level are being requested to provide ever greater services in many areas. Thus, they must know how funds are used in order to allocate wisely the dollars available. They are all aware of the continuous increase in total funds requested. They must know whether unit costs as well as total costs are increasing; they must know why.

Institutions that provide effective information, that are willing to supply data indicating changes in factors affecting costs, and that make every effort to effect economies consistent with maintenance of quality will undoubtedly gain the confidence of those who provide financial support. They should receive sufficient funds to provide quality higher education for their students. Institutions that fail to provide appropriate analyses of the factors affecting costs may lose the confidence of the public. They may suffer a decline in gifts, bequests or donations and may be subjected to arbitrary reductions in allotments or appropriations.

Earlier Studies of Factors Affecting Instructional Costs

Cost analyses and attempts to develop unit costs are not particularly new insofar as Colleges and Universities are concerned. Numerous attempts to measure instructional costs have been made during the past three decades or more. A number of articles on cost analyses were written in the twenties, and the financial reports of a few institutions at that time indicated costs per student. In 1932 the National Committee on Standard Reports for Institutions of Higher Education published Bulletin No. 3 entitled A Study of Methods Used in Unit Cost Studies in Higher Education. In 1935 this committee published a volume entitled Financial Reports for Colleges and Universities.

The volume published in 1935 contained a detailed plan for unit-cost computations. The plan included a method of allocating overhead or indirect costs as well as an anlysis of direct instructional costs. During this discussion we are primarily interested in an analysis of instructional costs, and, therefore, the brief description of the plan developed by the National Committee will be limited to that area. The plan proposed that instructional costs be computed for departments on a student-credit-hour basis, for divisions on a student-credit-hour or a full-time student equivalent basis, and for the institution as a whole on a full-time student equivalent basis. These costs were computed after a distribution of faculty time based upon instruction, departmental administration, divisional administration, institutional administration, research, public services, and so forth. Costs were analyzed by levels of instruction as well as by division and department. The proposed plan was quite comprehensive and I recommend it to you for review. Unfortunately, this volume has long been out of print, but if you have not had an opportunity to study this plan for cost computation, it might be worth an inquiry at your library.

In 1937 the United States Office of Education published Bulletin No. 21, entitled University Unit Costs. This study was based upon the plan of cost computation proposed by the National Committee in the 1935 volume. Nine large universities participated in the study.

In spite of the fact that all participating institutions were large universities, and might therefore have some degree of homogeneity, there were wide variations among institutions with respect to cost per student credit-hour for the same subjects or fields of discipline. In this study, as in others, attention was directed to the need for caution in interpreting results and in attempting to compare one institution with another. It was emphasized that many assumptions had been made and that there are many "imponderable elements not susceptible to arithmetic measurement."

In passing, I should say that I agree with the need for caution, but even cost analysis for commercial and industrial firms requires some judgment and involves a degree of subjectivity. This alone should not be used as an excuse to avoid cost analysis. An analysis accompanied by a statement indicating both strength and weakness still might be very useful.

The United States Office of Education study also revealed major differences in student-credit-hour costs among the several fields of discipline within the same institution. I presume that this was not unexpected and is indicated also in studies today.

One part of the study revealed substantial uniformity with respect to student-credit-hour costs. This was the greater cost of upper division as compared with lower division and the even greater costs at the graduate level for the institutions as a whole. However, the differences in costs per student-credit-hour between the lower division and graduate level ranged from approximately twice as large in one institution to approximately five times as large in another. The progressive increase in cost from one level to another was not necessarily true for individual fields of discipline. For example, in one field of engineering, an institution reported a higher cost per studnet-credit-hour at the lower division than at either the upper division or graduate level.

A careful review of this study appears to indicate that the greatest variations in cost result from differences in the production of credit hours in relation to total instructional costs. Thus, salaries and faculty productivity largely determined the unit cost of instruction.

Faculty productivity is related to both class size and teaching loads. These are the factors with which we will be concerned in our discussion today.

What has happened to cost studies and cost analyses since the publication of the United States Office of Education Study in 1937? Unfortunately, World War II was upon us very shortly thereafter. Within a few years colleges and universities became armed services camps. To be sure, unit costs were not forgotten entirely. Various methods were developed to determine payments for ESMDT, ESMWT, ASTP, V-12, V-5 and similar programs designed to promote the war effort of our nation and our allies. These methods were largely based upon rather hurried agreements and some compromises. Little real progress was made which would enable institutions to evaluate their normal costs.

When the war ended the nation provided benefits for returning veterans. A "G. I. Bill of Rights" gave to each returning member of the armed services a "credit" for educational opportunity. Again we "reviewed costs" and decided whether non-resident tuition or a cost factor for instruction would be most appropriate as a charge for the instructional services of our colleges and universities. Regardless of the decision that was made, a substantial portion of the instructional cost of higher education was underwritten by the Federal Government during the latter part of the forties. During the same period of time the purchasing power of the dollar shrank to a new low level.

By 1952, expenditures for educational and general purposes exceeded two billion dollars a year. The G.I. wave had subsided, and municipalities, states, friends, alumni and students were asked to provide a substantially greater portion of funds for operations. In view of the shrinking dollar and the predicted tidal wave of students, serious questions were raised relative to the future support of higher education. About this time the Commission on Financing Higher Education published an impressive volume by John D. Millett entitled Financing Higher Education in the United States. You may wish to review this volume and in particular those chapters dealing with factors in educational costs and program analysis of educational costs. The Commission stated that faculty salaries are important as a cost factor, but further indicated that "faculty salaries are not necessarily the controlling factors in determining instructional costs. High salaries which go along with a relatively high student-faculty ratio and a fairly high teaching load can make for low instructional costs." Again we note that class size and teaching load or, if you please, faculty productivity was considered a major factor in determining unit costs of instruction.

Complexity of Analysis

Now in the last year of the present decade and, therefore, in the very early years of the tidal wave, we generally are aware of the desirability or even necessity of analyzing costs for future planning in the use of available resources. The many factors affecting costs again come to our attention. Most of us are becoming increasingly aware of the difficulty in recruiting and retaining outstanding faculty members. Salaries have improved but are still much too low, and we recognize that salaries in higher education must be consistent with those in other fields of endeavor. However, if salaries are to be increased substantially, if enrollments are to be doubled, and if the dollar continues to shrink, some modifications must be made in the factors affecting costs. The factors are many and complex. Analysis and change will not be simple.

The scope and type of the educational program itself has a substantial affect upon total and unit instructional costs. As previously indicated, there is a wide variation in costs among the several fields of discipline within an institution. These costs also vary from institution to institution. Most of the studies undertaken to date indicate relatively low unit costs for law and business administration, and relatively high costs for medicine and the physical sciences. It is interesting to note that law and business administration have been among the last survivors of the proprietory schools. High "faculty productivity" and corresponding low unit costs may have encouraged the continuation of these proprietory schools.

One of the next important factors affecting costs is the distribution of faculty time. This is exceedingly difficult to determine and must be based upon the judgment of individual faculty members or a departmental chairman. In many of our colleges and universities, faculty members spend a portion of their time in teaching, research, public service, departmental administration, college or university administration and committee assignments. For obvious reasons no one would suggest that time clocks be installed for use by the faculty. Nevertheless, some means must be found to determine actual instructional costs by separating these from the cost of other services provided by members of the faculty. It is this time distribution that has caused much discussion and some controversy. However, even commercial and industrial organizations are faced in part with similar problems. To be sure, the time of the skilled worker on an assembly line can be fairly well allocated, but the time of the supervisor and the professional man who may spend time on several activities or projects must be allocated to produce unit costs. The techniques involved in any time allocation always may be subject to question, but, if applied consistently, the results may still be reasonably satisfactory. As far as the faculty is concerned, if a pattern of time allocation is once established, it could be used from year to year with only periodic spot checking.

A third factor affecting both total and unit costs is the level of instruction. As previously indicated, there appears to be a consistent increase in over-all unit costs as we progress from one level of instruction to another. Again, however, there are complications. Some courses are available to both lower division and upper division students, and certain courses may be open to both undergraduates and graduates. This will add to the complexity of cost analysis and will require judgment with respect to cost determination by levels of instruction. All costs might be classified according to the status of individual students but more usually according to level for which the course is primarily designed.

A fourth factor affecting instructional costs is that of the distribution of faculty by rank. Institutions generally provide for a gradual advance in academic rank for qualified faculty members. The upper academic ranks usually command greater salaries. Thus, as the faculty matures, costs must of necessity increase. If the institution does not grow in size and if there is little faculty turnover, costs will continue to advance. An interesting condition occurred during the temporary decline in enrollment in the late forties. Costs actually increased since few teaching assistants or beginning instructors were appointed during the period of declining enrolling.

Class size and student faculty ratio are still other factors affecting costs. On the surface it would appear that these factors are least complex and might easily be adjusted to modify both total and unit costs. However, these factors have been so closely related to the concept of quality in education that many institutions have been reluctant to effect any substantial change. In spite of the fact that several writers in the field of higher education have given specific examples of what might be done to improve salaries and recruit top instructional faculty if class size or student faculty ratios were modified, institutions have still attempted during the past years to "improve student faculty ratios," i.e., decrease the number of students per faculty member.

Closely related to class size is teaching load. There apparently has been a general belief that in order to recruit and retain top quality faculty members, the institution must provide a minimum teaching load. Furthermore, this teaching load may be reduced if the faculty member shows unusual promise in the field of research.

A seventh factor affecting instructional costs is the general level of faculty salaries. If all other factors could be held constant, it is obvious that the institution which pays the highest salaries will have the highest costs. By this time, however, it is quite clear that many of these factors affecting costs are so inter-related that each must be considered separately and in relation to all other factors if an accurate cost analysis is to be made.

Perhaps more has been said and less has been done about proliferation of courses than any other single factor. It would appear that the abandonment of courses would be a simple way in which to reduce costs. Unfortunately this is not the case. Many courses with very low enrollments are maintained in order to provide a complete curriculum. Courses may be added and retained in order to recruit and retain faculty members. Still others continue to be offered in deference to particular faculty members who have had many years of service and who may have an emotional attachment for a particular course that they have given for many years. Proliferation of courses is not only the result of faculty wishes. The advance of knowledge, the demand for specialization at upper levels, and the need to prepare students to participate in an increasingly technical society also have brought a substantial increase in course offerings.

Degree requirements may vary substantially from one discipline to another. The total number of courses, the number of required courses, the type of courses, and the amount of laboratory work all will have an impact upon total and unit costs. This again will add to the complexity of analysis and will increase the difficulty of comparing costs within and among institutions.

Finally, the selection of a unit to determine cost or productivity creates further problems. No general agreement as yet has been reached relative to the usefulness or validity of the several units which may be used. The "full-time student equivalent" has been proposed, but this tends to ignore certain costs involved in providing space and teaching facilities for two part time students who may select the same course at the same time. The "student credit hour" was suggested in the 1935 volume of the National Committee on Standard Reports for Colleges and Universities. This was used in the 1937 study of the United States Office of Education. Again, there is an inherent weakness since the credit hour represents the institutional award to the student for attending a given number of class hours. If these class hours involve laboratory sessions the credit hours awarded may be substantially less than the actual class hours attended. Student class hours per week probably represent one of the least complex units that can be used. However, it should be recognized that these account only for the cost for each hour of attendance. Thus a scientific course requiring a laboratory session might meet three hours during a week and provide two credit hours, whereas a course in humanities might provide three credit hours for three hours of meetings. The cost of each hour of meeting might be the same, but the credit hour cost in the scientific course would be greater than the credit hour cost in humanities.

No standards or norms have been developed in our educational programs, and no adequate measures of quality have been devised. Quality must be related to the end aims and objectives of the institution. The automotive industry can produce a low priced vehicle or an expensive automobile. Both may be quality cars within the intent or objective of the industry. We do not know whether the student-faculty ratio should be ten, twenty, or thirty to one. We do not know whether classes should have an average of twenty or one hundred students, whether students should attend classes for ten or fifteen hours per week, or whether faculty members should teach six, nine or twelve hours per week. We do know, however, that we can materially change unit costs by modifying the major factors affecting these costs.

This, then, must be our challenge, to experiment with changes that will provide maximum educational opportunity consistent with the quality necessary to meet the objectives of our institutions.

Effect of Class Size and Teaching Load on Instructional Costs

Exclusive of faculty salaries, two major factors appear to have the greatest impact upon instructional costs--the size of the class and teaching load. Or, stated another way, instructional costs are largely determined by the productivity of the faculty. In a recent publication by Beardsley Ruml and the late Donald H. Morrison, models were developed for liberal arts colleges of various sizes. In each model it was assumed that there would be an average student faculty ratio of 20 to 1 and that each faculty member would have a teaching load of 9 to 9 1/3 hours per week. A somewhat similar proposal was made by John D. Millett some number of years ago. Each study suggested that major salary adjustments could be made by establishing a fairly high student faculty ratio or average classs size and a fairly high average teaching load. The latest study will and should receive careful consideration by faculty members, administrative officers and members of governing boards. Yet we must carry the analysis further in each of our institutions to be certain that we do not over-simplify and that we consider the distribution of students by instructional level and the type of educational program to be provided.

Some variation in class size may be appropriate and desirable among the several levels of instruction. This does not mean that class size must necessarily decrease with advances in the level of instruction. Traditionally smaller classes at the upper division or beginning graduate level may be due as much to the decrease in the number of students and to greater specialization as to any deliberate attempt to provide greater individual attention to the students. At the graduate research and doctoral level, the need for small classes or individual instruction is quite obvious. However, the general tendency toward smaller classes as the level of instruction advances has resulted in an increase in unit cost at the higher levels.

No intelligent decisions relative to class size can be made without a careful analysis of existing class size by levels of instruction. No over-all standard of class size can be imposed upon the institution. If students at the upper division or graduate level are not available in the same numbers as the lower division there must be either a substantial reduction in course offerings or a reduction in class size. On the other hand, an institution that receives large numbers of students at an advanced level may find it both possible and necessary to establish different standards of class size for the advanced levels of instruction than those institutions which traditionally find themselves with large freshman classes and a decreasing number of upper classmen or graduates. It may be entirely appropriate and desirable to establish different standards of class size or student faculty ratio at the different levels based upon the differences in numbers of students available at the several levels.

Class size also must be analyzed in terms of the educational program and the fields of discipline. In certain curricula large classes have been almost traditional regardless of the level of instruction. As already indicated, large classes at the graduate level in law have resulted in low unit costs in spite of relatively high faculty salaries. To some extent large classes in business administration and education have also resulted in low unit costs. On the other hand, smaller classes in physical sciences, engineering and medicine have produced relatively high unit costs. Whether such higher unit costs in selected fields of discipline are justified on the basis of necessity or quality must still be considered.

If appropriate space were available and if all other factors affecting costs could be held constant, a doubling of average class size at all levels would nearly cut instructional unit costs in half. To be sure, we might have to revise our concept of the proper size for classrooms and laboratories, and this might involve some one-time remodeling costs. We might also need to provide some further assistance for the faculty in grading papers and performing other routine chores. We would also need some additional supplies and equipment for our classrooms and laboratories. These would be nominal in view of the tremendous increase in faculty productivity which would occur, regardless of the units used to calculate costs. There would remain, however, the larger question, What effect would doubling of class size have upon the quality of instruction? Perhaps a possible deterioration in the learning environment could be offset by a careful study aimed at providing lecture sessions, class instruction, seminars and individual instruction at all levels and in all fields of discipline. At least further experimentation might prove very useful.

An increase in faculty teaching load of ten to twenty-five per cent also would have a material impact upon unit costs, since again the productivity of the faculty would be increased substantially. In reviewing the possibility of increasing the teaching load, we are confronted with even more difficult problems. Again we must consider the level of instruction and the need for much personal attention at the doctoral level. On the other hand, we must also consider the need for personal attention for beginning undergraduates. We must recognize differences among the fields of discipline, the need for outside preparation in rapidly changing fields, the need to correct papers, supervise teaching assistants and differences in effort required to teach three sections of the same subject as compared to teaching three different subjects. We must consider the effect that an increase in teaching load may have upon the quilty of instruction, research, and other scholarly pursuits of the faculty. Independent scholarly research has some impact upon the entire learning environment, and it is sometimes quite difficult to differentiate between instruction and that which is known as departmental research.

Finally, we cannot overlook individual differences in faculty any more than we can ignore differences among students. In spite of careful selection of faculty members and years of service required before the granting of tenure, there are and always will be substantial differences in capacity. There has been little inclination to modify teaching loads as a result of differences in capacity. To be sure there is some tendency to add other duties such as committee assignments, but occasionally the most gifted members of the faculty and those who might materially increase their teaching productivity are assigned minimum work loads in order to retain their services. In the July 8, 1959 issue of the Wall Street Journal there appeared an aritcle indicating that institutions were offering decreased teaching loads as a means of recruiting faculty. The need to recruit and retain outstanding faculty members is already acute and will become increasingly difficult. However, if the means of doing so is a reduction of productivity, the educational opportunities will decrease at a time when they must be increased very substantially. Increased productivity and increased salaries as suggested by Beardsley Ruml may be a more effective solution.

The California-Western Conference Study

This morning Dr. Doi discussed certain aspects of class size and teaching loads as related to instructional costs. He also described some of his own work in Colorado and other states. I should like now to briefly discuss certain phases of the California-Western Conference Cost and Statistical study and also to make some reference to studies of individual institutions in other states. Unfortunately, there are two limitations in connection with information that I can provide from the California-Western Conference study. The first limitation involves time, your time. A staggering volume of data was accumulated. I could discuss this for the balance of the week. The second limitation involves timing. Since the report of the study is about ready for publication, I am not free to discuss all aspects as readily as if it were already published.

You have in your reading material a statement of the purpose and procedure of the study, the standard classification used and certain forms and directions used in compiling data for the analysis of instruction. The forms and instructions for forms L-1, L-2, L-3 appear in Appendix A of this volume.

Although all expenditures of each participating institution were reported in order that they might be reconciled with annual financial reports, as indicated in the statement of procedure, three major areas of institutional activity were analyzed in greater detail. These were (1) administration, general expense and libraries; (2) instruction; and (3) operation and maintenance of the physical plant. In this discussion we are concerned only with instruction since we are interested in the impact of class size and teaching load upon instructional costs.

The instructional program data were reported in terms of the college or school and department in which the course was taught, the subject field of the course, levels of instruction, credit value and

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enrollment, type of instruction, i.e., non-laboratory, laboratory or individual student, the class hours per week and enrollment for each class or section of the course, and the instructor for each class or section. No detailed analysis was made of costs in medicine, dentistry, nursing and public health.

A quick review of the forms used to accumulate data for the instructional phase of the study will serve to illustrate procedure and type of information obtained. The first form (L-1) was used for both instruction and physical plant analyses. Separate sets of these forms were completed for each semester or quarter of the academic year. The data were separately reported for each campus of each institution, for each school or college within a campus, for each department and for each subject within a department. Every course taught during the academic year was reported; and for each course, the level of instruction, credit-value, enrollment, and number of classes or sections. The type of instruction, the class hours per week, the section enrollment and the instructor or instructors were also reported on this form. The data from form L-1 were used to calculate student-credit-hours, student class hours per week, the distribution of classes by subject, average class sizes, and so forth.

The second form (L-2) was used to distribute the time of each faculty member among his teaching and non-teaching activities and to report actual salary expenditure. It was at this point that an attempt was made to analyze and distribute time which is frequently budgeted or charged in total as a teaching cost. This meant a time distribution among actual teaching, departmental research, departmental administration and public and professional services, as well as a distribution of time for activities usually budgeted separately, such as organized research or general administration.

The division of the faculty members' time among the various activities or services was based upon the judgment of the head of the department, school or college to which the individual was assigned. The difficulty of making this division of an individual's time has been mentioned previously. There is still much disagreement regarding this distribution, both with respect to the validity and usefulness. Certain activities are so closely related, such as teaching and departmental research that arbitrary decisions which may be necessary tend to destroy validity. Furthermore, it is generally expected that a faculty member will teach as well as conduct research. The usefulness of any time distribution has therefore been questioned.

However, since distribution of time is a significant factor in determining faculty productivity, it would appear wise to at least review such possibility particularly if comparisons are to be made with other institutions. Even in an intra-institutional analysis, time distribution would be significant in accounting for variations among departments and fields of discipline. In any event a series of studies extending over a period of time would serve to indicate trends. This would be useful regardless of whether a detailed breakdown of time was involved, and would indicate changes in faculty productivity.

On a third form (L-3) all departmental expenditures for purposes other than teaching salaries were reported. These included expenses for non-faculty wages, supplies and expense. This form also was used to show the distribution of expenditures between the academic year and the summer session, and the distribution of the academic year expenditures among the levels of instruction in the teaching program and among non-teaching functions of departmental research, departmental administration, and public and professional services.

As would be expected, the departmental expenditures reported for purposes other than teaching salaries were, in general, substantially less than those reported on form L-2. However, there were significant variations because of the requirements of certain fields of discipline. Non-faculty salaries and equipment purchases tend to be somewhat higher in scientific fields. Thus, while faculty productivity is still the largest factor affecting costs, these costs could presumably be modified, rather materially, by changes in equipment purchases or changes in the number of non-faculty personnel employed in academic departments.

These three forms briefly described were the basic ones used to accumulate information regarding the instructional program. Several other forms included in your material were used for limited purposes, such as providing the dollar amounts required for the instructional forms. The data available from these instructional forms was tremendous. A complete tabulation was provided for each campus of each participating institution.

Both the techniques and results of the study have been used by a number of participating institutions for additional studies. Unfortunately, at the present time there are no definite plans to continue cooperative studies. Several drafts for a published report have been prepared. The final draft is nearly completed and should be published early in the fall. The published report will be quite brief but will be sufficient to indicate procedures and techniques and the results which may be obtained if these techniques are followed.

The greatest value of the study accrued to participating institutions. However, other institutions may wish to use the procedure developed for internal studies or studies in cooperation with other institutions. The fact that a number of institutions could finally agree upon classification, the use of units of measurement and distribution of faculty time was in itself somewhat remarkable. There was no final agreement as to whether student credit hours or weekly student-class-hours were most appropriate. Both were used in the study and either or both may be used in the future provided that there is consistency in use.

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As previously stated, there was much discussion relative to the desirability of distributing faculty time. However, since faculty productivity involving teaching load and class size is such a major factor in determing costs, the institutions remaining in the study agreed that time distribution should be attempted in order to measure faculty productivity more effectively. In fact faculty productivity alone can serve as an excellent guide for institutional planning even if no attempt is made to develop unit costs. Changes in productivity resulting from an increase or decrease in teaching load and an increase or decrease in class size are so closely related to instructional costs that institutional officers can readily predict future needs by analyzing trends of productivity.

The California-Western Conference study made no attempt to evaluate quality. The lack of objective means to evaluate quality has undoubtedly led to some reluctance to develop statistical studies. Since the "product" of the instructional program of a college or university consists of the development of an environment conducive to learning and since the capacity for learning varies substantially from one individual to another, it is doubtful if any completely objective means can ever be developed to measure quality. If quality is related to ultimate success of faculty or graduates, we must define success in terms of factors currently related to success. These may be scientific achievement, business ability, scholarly pursuits, political or diplomatic accomplishments, service to mankind or just getting along with your neighbor.

The California-Western Conference study has been criticized for its detail and complexity. It was an ambitious undertaking, and it is obvious that such a study might be financially difficult for many institutions that do not have substantial support from outside sources that was available for this study. Again, however, if a pattern of faculty productivity were once established, it may be possible to accumulate data year after year with only occasional checking of the validity of such a pattern. Furthermore, a number of "short-cuts" may be made, as will be indicated in the published report.

A number of studies are now under way on a continuous basis both statewide, as far as publicly controlled institutions are concerned, and by individual institutions for both publicly and privately controlled colleges and universities. Some of these studies are conducted through statewide coordinating boards, or commissions such as Texas, New Mexico, Oklahoma, etc. Others are conducted on a voluntary basis as a result of agreement among the publicly controlled institutions of higher education. This is presently the situation in Indiana. There are also some attempts to study instructional programs and costs in specific fields of discipline among several institutions. The cost of medical education may be studied on a pilot basis.

Individual colleges and universities in increasing numbers are undertaking institutional research that includes a study of the instructional program. The Universities of Illinois and Minnesota and Michigan State University are among those undertaking fairly comprehensive studies for internal use in planning. There are many others, of course. While most studies involve statistical analyses of the several functions of the institution, there appears to be a trend toward a more detailed study of the instructional program and the impact that faculty productivity has upon instructional costs. Most of the institutions use these data in planning and budgetary development, but, to the best of may knowledge, few, if any, are actually using program or cost accounting as a part of their regular budgetary operation and accounting procedure.

It is my firm conviction that within a few years most of our colleges and universities will develop programs of self analysis in order to determine costs. It is my sincere hope that there will be favorable faculty response and participation in these analyses and that these studies will lead to wiser use of resources, greater educational opportunities and improved faculty compensation. The greatest value will be intra-institutional, and will come as a result of continuing studies using the same guides and techniques which will indicate trends for future planning. There may be some value in making inter-institutional comparisons, but these will be of less significance than a periodic check of cost trends or productivity within an institution.

A single one-time study would appear to have very limited use. The chances are extremely remote that costs will ever again in the future be identical to those observed at a given period of time. Changes in faculty, student population, curricula--in fact any change whatsoever in any of the factors affecting costs will change total and unit costs. The analyses in the future should involve a continuous study of all factors affecting costs.

Since, however, such a large portion of resources are used in the instructional program, we should be increasingly interested in the class size and teaching load, the two factors involving faculty productivity that can dramatically change unit costs in a very short period of time.

Space and Campus Planning

XIII. Space Utilization Surveys in Large Institutions

. . . . Donovan E. Smith

Definition of Terms

I do not propose here to establish definitions for the sake of standardization, but merely to explain what I mean by some of the terms--and to do so merely for the sake of clarity in this discussion.

(1) The term "space-utilization study," is so well-established with the conventional, limited meaning, "the study of the scheduled utilization of instructional rooms by organized classes," that I have given up trying to get the meaning broadened to take into account all the rest of the physical plant. I'm still searching for a term to identify a study that takes into account the various factors in the utilization of all space, not just that relatively small part that the classrooms and teaching laboratories represent. So I'll try to be conventional and, by using the word "utilization"--generally adding the word "rate"--refer to the kind of data produced by tabulating class-hours and student-hours (or, if you prefer, "student-class-hours") per week, per day, per time-of-day, and so on.

(2) "assignable square feet" is a term coming into fairly wide use as representing the interior areas that house the productive activities in a building, based on wall-to-wall dimensions within each room. Many terms have been used in the past--"net," "useful," "net useful," and "usable." (Some people have measured from center-lines of walls, although how they do this is something I've never quite been able to understand. It must be a rather messy operation to go about drilling holes in each wall in order to measure their thicknesses, to locate the center-lines.) By "Assignable square feet," then, I mean simply the measurement from the interior surfaces of walls, with no necessary connotation as to whether or not the space has been productively assigned. But note the implication that it can be so assigned--and therefore the exclusion of such general-circulation areas as corridors and stairs, such building-service areas as mechanical-equipment rooms and janitor's closets, and such areas as public toilets--and, of course, all the walls and partitions themselves.

(3) The definition of "types of rooms," is one for which I would refer you to other sources, since there is some general agreement on how these terms are used. The Manual for Studies of Space Utilization in Colleges and Universities by John Dale Russell and James I. Doi

and Donald Jones' Physical Facilities Analysis give very adequate definitions. So if any of you are interested in a standard classification of rooms by types for a space survey, I couldn't guide you any better than could either the Russell-Doi manual or the Donald Jones book.

(4) "Scheduled utilization" is a term I've tried consistently to use when I'm speaking only of the conventional measurement--class-hours per week per room, student-hours per week per station, and percentage relationship between size of class and size of room--and I'll try here to use this limited term for this limited application if I don't use the conventional term, "space utilization."

(5) By "academic program" all I'm really talking about is a quantitative definition of a projected educational program--spelled out in terms of student-credit-hours, full-time-equivalent students, or whatever measurement the institution uses, projected numbers of staff, and other figures. There are data which "planning analysts" or architects can translate into a concrete plan (for either a concrete or steel building). Statements of philosophy, purposes, educational aims, hopes, and aspirations are certainly necessary, but they can be very frustrating to the person who has to develop a precise, written, numerical description of a building, and then translate that description into working drawings which sharply delineate the physical features that will then determine, within fairly narrow limits, what can be done by how many persons. So, by "academic program," I mean only this quantitative spelling-out of the real academic program.

Basic Formulas

We might as well now go into some algebraic formulas. I do not propose to make this a lesson in mathematics; my purpose in presenting these formulas is merely to point out the relationships which are represented.

Basic formulas: $F = \frac{T\ S}{U}$ and $G = \frac{k\ S}{U}$,

in which F = floor area per unit quantity of academic program, e.g., ASF (assignable square feet) per 100 SCH (student-credit-hours for one semester),

T = quantity of specific type of teaching per unit quantity of academic program, e.g., SH (student-hours per week) per 100 SCH, or SH per FTE (full-time-equivalent) student,

S = space (floor area) per station for specific type of teaching, e.g., ASF per teaching-laboratory station, including floor area of related laboratory-service rooms,

U = station-utilization rate, e.g., SH per station, G = floor area per unit quantity of specific type of teaching, e.g., ASF per 100 SH,

k = constant, e.g., 100 if G is expressed as ASF per 100 SH.

A study of the kind to which I have referred sarcastically as the conventional utilization study is one that covers only the one factor, U, the station-utilization rate in organized-class facilities--and sometimes only the room-utilization rate, which is merely one of two subfactors of this.

Most judgments of an institution's level of performance in physical-plant utilization, and most evaluations of an institution's student capacity have been based on a consideration of this single factor. Obviously, however, in a formula or algebraic equation such as this one, doubling any one of the three independent variables (T, S, or U) will change the numberical value of F by the factor of two. In other words, either doubling or halving any one of the three factors--(a) relative amount of the particular kind of organized-class instruction, (b) floor area per station, or (c) station-utilization rate--will double or halve the floor area per student, or per any student-related unit of measurement. Therefore, in an actual case--and I have seen several such cases--the floor area per student, or per FTE student, or per student-credit-hour, can be as much as eight times greater in one instance than in another.

Even such an old and well-established subject as chemistry, even freshman chemistry, can be, and is, taught with a wide variability in the amount of laboratory instruction--say, two 2-hour meetings per week, or one 3-hour, all the way to two 3-hour meetings per week, plus two or three hours of lecture--for a fairly limited range of credit values, generally. Obviously, if there is twice as much laboratory instruction for a given amount of credit in one instance, then a given amount of "production" in terms of student-credit-hours will require twice as much laboratory space as in the other instance. Similarly, if--for good or bad reasons--the one laboratory situation provides twice as much floor area per student accommodated at one time (that is, floor area per station), then that factor in itself will double the total requirement. And if there is then a two-to-one difference in the station-utilization rates, the combined effect of the three factors can be an eight-to-one difference in the two laboratory floor areas per student-credit-hour or per other student-related unit of measurement.

This was precisely the situation in a pair of cases in the California and Western Conference Cost and Statistical Study--an eight-to-one relationship between the floor areas per 100 student-credit-hours at the two ends of the scale, in the specific subject field. The one case, as compared with the other, had almost exactly twice the relative amount of laboratory instruction, almost exactly twice the floor area per

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station, and--to top it off--almost precisely one-half the station-utilization rate. The resulting eight-to-one range is *much* greater than anyone would deduce by looking only at the station-utilization rate--or even at the floor area per station and utilization rate combined.

Conversely, there were cases in which the institution with the highest station-utilization rate in a given subject field was using considerably more floor area in teaching-laboratory facilities for a given number of student-credit-hours than was some other institution with a much lower utilization rate, because the differences in respect to the other factors far more than offset the difference in utilization rates. In such cases, if conclusions as to relative per-student floor areas were to be drawn, the utilization rate by itself would tell not only an incomplete story, but actually the *wrong* story.

The formula for "G" is simply the "F" formula with the teaching-method factor removed. The "G" formula is the one more commonly used. I have to confess that it represents the more direct approach, particularly for the translation of projected teaching programs into projected space requirements. I dislike it, however, because it *does* exclude the academic factor of the relative amount of each type of instruction, and therefore takes the existing teaching methods on faith. I think those methods are as much subject to question as are any other factor; certainly if they are not changing enough to be a factor in the physical planning, then they *should* be examined!

My way--the "F" formula--requires a little more arithmetic, but I feel safer that way because it requires examination of *all* the factors, and because it is not so likely to lead to the false inferences that the "G" formula practically *invites* the user to draw. I don't propose here to discuss the differences between the two formulas and their applications--basically the difference between data based on student-credit-hour measurements and those based on student-hour (or, as some people call them, student-class-hour) measurements--because *that* discussion usually develops into an all-day argument. In this field--physical-plant analysis--the use of student-credit-hour measurements is by no means as general as it is in many cost studies.

Some General References

I would recommend to you Nathaniel Becker's article, "Space Analysis in Architecture," which appeared in *The Journal of the AIA* this spring because I feel that, although the field of study concerned is industry, commerce, and government, Mr. Becker's article is an excellent description of the functions performed by persons like myself who are trying to bridge the gap between the academic program and the architectural plan in translating the words and numbers describing the one into those describing the other. I think the ideas and principles in the article are good.

I should like to comment at this point on some excerpts from my own Report on Utilization of Instructional Rooms. I must confess that this report is as guilty of concentrating exclusively on the instructional rooms as are any of the utilization studies on which I have cast aspersions in the past.

Teaching-lab Utilization by Each Department Group

Table 11 lists the station-utilization rate and its two factors--the room-utilization rate and the students-to-stations relationship--for the teaching laboratories of each of the seven principal groups of teaching-lab users at each campus. It is almost as difficult to draw sensible conclusions from these figures as from corresponding campus-wide averages, for an intelligent analysis of teaching-lab utilization requires, in many instances, an examination of the circumstances in the individual rooms and in the individual classes that can be scheduled in a given room. Nevertheless, most of these sets of three figures each--e.g., items A, B, and C in each instance--are so consistent with each other that the finding of something startlingly different in a more detailed examination seems unlikely. I suspect that the same question would still remain: "Isn't there some way that a very expensive student-station can be scheduled more than about a dozen hours per week--especially at a time of unlimited prospective enrollments and very limited prospective capital-outlay funds?" (These teaching-lab stations represent a capital investment of at least $3,000 each; and, on the five campuses covered by this report, we now schedule a total of nearly 200,000 laboratory student-hours per week. The arithmetic of doubling such a teaching program with present utilization rates is as simple as it is frightening.)

Summary of Utilization Measurements

Table 12 summarizes the principal utilization data of this report and lists the principal absolute numbers involved. To me, the most dismaying figures are those listed as items F and G for classrooms. The item-F figures for Berkeley, Los Angeles, and Davis--the average number of stations in a classroom--are essentially the same as those which I began finding at the end of World War II, in part because many of the present classrooms at those campuses are those which were then in existence. At Riverside and Santa Barbara, however, we have been able to make a completely fresh start with the hope of doing a better job of fitting the room sizes to the class sizes--first at Santa Barbara, and then at Riverside. This accounts for the fact that the classrooms at Santa Barbara average 56 stations each, as compared with 83 at Berkeley and Los Angeles, and 100 at Davis, and that the classrooms at Riverside average the still smaller number of 40 stations each. So what happens? The number of students in the classes scheduled in classrooms is no nearer the number of stations at Riverside and Santa Barbara than anywhere else!

Donovan E. Smith

TABLE 11

UTILIZATION OF TEACHING LABORATORIES — BY DEPARTMENT GROUPS — FALL SEMESTER, 1956

ITEM	BERKELEY	LOS ANGELES	DAVIS	RIVERSIDE	SANTA BARBARA
AGRICULTURE					
A. Student-hours per week per station	6	2	9	--	--
B. Class-hours per week per room	13	9	12	--	--
C. Mean enrollment as percentage of stations[a]	47%	21%	66%	--	--
ARTS					
A. Student-hours per week per station	13	13	11	--	7
B. Class-hours per week per room	14	21	12	--	13
C. Mean enrollment as percentage of stations[a]	76%	66%	91%	--	48%
ENGINEERING					
A. Student-hours per week per station	12	18	--	--	--
B. Class-hours per week per room	17	20	--	--	--
C. Mean enrollment as percentage of stations[a]	64%	87%	--	--	--
MISCELLANEOUS PROFESSIONS					
A. Student-hours per week per station	10	8	5	--	7
B. Class-hours per week per room	15	13	17	--	16
C. Mean enrollment as percentage of stations[a]	65%	59%	32%	--	38%
BIOLOGICAL SCIENCES					
A. Student-hours per week per station	13	11	11	6	15
B. Class-hours per week per room	16	15	14	12	17
C. Mean enrollment as percentage of stations[a]	83%	68%	71%	49%	74%
PHYSICAL SCIENCES					
A. Student-hours per week per station	12	12	11	6	6
B. Class-hours per week per room	17	18	14	12	10
C. Mean enrollment as percentage of stations[a]	71%	65%	81%	45%	63%
SOCIAL SCIENCES					
A. Student-hours per week per station	12	6	--	2	9
B. Class-hours per week per room	18	11	--	6	13
C. Mean enrollment as percentage of stations[a]	64%	43%	--	28%	70%

a - Weighted by the number of class-hours scheduled in each room, and therefore not necessarily equal to the percentage relationship of item A to item B.

TABLE 12

SUMMARY OF UTILIZATION MEASUREMENTS AND RELATED DATA — FALL SEMESTER, 1956

ITEM	BERKELEY	LOS ANGELES	DAVIS	RIVERSIDE	SANTA BARBARA
CLASSROOMS					
A. Student-hours per week per station	10	13	8	8	8
B. Class-hours per week per room	25	29	27	21	17
C. Mean enrollment as percentage of stations[a]	47%	46%	33%	42%	45%
D. Number of rooms	228	158	28	25	51
E. Total number of stations	19,032	13,150	2,795	1,006	2,863
F. Mean number of stations	83	83	100	40	56
G. Mean number of students	35	37	30	15	27
SEMINAR ROOMS					
A. Student-hours per week per station	10	7	4	12	5
B. Class-hours per week per room	17	15	7	17	11
C. Mean enrollment as percentage of stations[a]	60%	46%	55%	64%	47%
D. Number of rooms	58	45	8	8	12
E. Total number of stations	1,177	882	143	131	278
F. Mean number of stations	20	20	18	16	23
G. Mean number of students	12	9	10	11	10
TEACHING LABORATORIES					
A. Student-hours per week per station	11	12	9	5	8
B. Class-hours per week per room	16	18	13	12	14
C. Mean enrollment as percentage of stations[a]	68%	64%	69%	40%	51%
D. Number of rooms	228	169	82	20	61
E. Total number of stations	5,943	4,710	1,906	479	1,733
F. Mean number of stations	26	28	23	24	28
G. Mean number of students	19	19	17	10	17

a - Weighted by the number of class-hours scheduled in each room, and therefore not necessarily equal to the percentage relationship of item A to item B, or of item G to item F.

Nor can it be inferred that it is the reduction of average classroom size that has *caused* the reduction of average class size. The item-C figure for classrooms--the students-to-stations relationship--was once 55 per cent at, for example, Berkeley. In fact, that was the relationship in the period when Dwinelle Hall and its 80-odd classrooms were being planned on the basis that the projected sizes of the classes to be scheduled therein would average 75 per cent of the room sizes. So, again, what happened? The classrooms in Dwinelle Hall were built as planned, and the classes of the expected departments were scheduled therein, and--in the very first fall semester that the building was occupied--the class sizes in Dwinelle Hall averaged exactly 55 per cent of the room sizes! While the building was being built, the classes shrank exactly as much as we had shrunk the number of stations in the classrooms!*

At that point, I began seriously to question the theory that it made better sense to fit the sizes of the rooms to the sizes of the classes by proper physical planning than by administrative efforts to make the classes fit the rooms. I can recall no instance in which an instructional room has been built larger than was requested by the building committee, and I can recall several instances in which the capital-outlay funds would not stretch as far as had been requested. Furthermore, the building committees are, by and large, constituted of staff members who expect to teach classes in the rooms which the committee is "programming." I realize that to ask some questions is unrealistic, if not unwise, but I can't help wondering what the answer would be if someone with high administrative authority asked the question, "Why can't classes be more nearly the size that practically everyone has in mind when he serves on a committee that is planning a new building?"

In each section of table 11, the "A" item--student-hours per week per station--corresponds to the factor, U, in the "F" and "G" formulas. Those of you who have seen the chapter on normative data in the Russell and Doi *Manual for Studies of Space Utilization* will note that we (University of California) are "normal"--that is, teaching-laboratory utilization rates are generally in the neighborhood of 10 student-hours per week per station. And so, there is a first paragraph of dismay since these teaching-laboratory stations represent a capital investment of about $3,000 apiece. The "now" there referred to was a couple of years ago, at which time we had the 200,000 weekly laboratory student-hours. The "simple arithmetic" is completely obvious--200,000 students at the rate of 10 per station would require 20,000 stations, and 20,000 stations at $3,000 each would require $60,000,000--and *that* will certainly serve as the frightening estimate

*The classes shrank *more*, that is, than the amount by which they had been expected to shrink from their veteran-bulge size.

of what it would cost for teaching laboratories alone if we were to double our teaching program with present utilization rates.

The text preceding Table 12 mentions our concern over the great disparity between the average enrollments in the classes and the average capacities of the rooms, which is indicated in that table, and the continuation of this situation, despite efforts to correct it.

I can't say that anything has happened as a result of this report. I feel--and not unhappily--that this kind of work has to be conducted as part of a little-drops-of-water process, in the hope that some good will come from the cumulative effect of many small recognitions of logic and scattered increments of gain. I would not even refer to this report as an example of institutional research, except as the last paragraph argues the need for true institutional research on such questions as class size--not the question of what the sizes have been in the past, but of what the sizes and the teaching methods are going to be in the future. Otherwise, I'm afraid that, 20 to 40 years from now, the classrooms in which we'll then be operating will be no better suited to the instructional methods of the day than are the 20-to-40-year-old classrooms in which so many of our present classes are conducted.

Standards

I would distinguish between "Averages and Statistical Allocation" and "Individual-Room Criteria." What I'm referring to is the difference between the situations of a large institution and of a small institution, and the differences that develop as the small one grows and becomes medium-size, and then, perhaps, large. Certainly, long before one's institution reaches the scale of operation of the University of California, the point has been reached at which it is no longer possible for any one person to look at all the data representing each individual room. One is driven to the use of IBM (or, to avoid charges of favoritism, I should say "punched-card and other data-processing equipment, including electronic"). As the size of the institution increases, one is forced more and more to statistical analyses, and is less able to look at the particular circumstances of the individual situation--the individual teaching laboratory, the individual classes scheduled in that laboratory, the combinations of sections of different courses that might be scheduled in the one laboratory--the kind of detailed examination that is the only way to make real sense out of a study of teaching-laboratory utilization in particular. To toss freshman chemistry into a statistical combination with advanced organic chemistry is about like the hash that is half horse and half rabbit. A certain amount of such combining seems, however, to be inescapable at our scale of operation, although on our individual campuses--and we still have a few that could loosely be called "small"--the local planning analyst is able to prepare charts with a block for each room, subdivided horizontally and vertically so that the sizes and identities of the individual classes scheduled in the individual room each hour of each day can be examined. One can much more intelligently analyze such cases than those in which the sheer mass of the data permits no closer examination than that of averages of groups of rooms for Monday, Wednesday, and Friday mornings and whatever other combinations one chooses to tabulate.

Similarly, in developing a preliminary building program and in analyzing a completed one--using the word "program" as an architect uses it, to mean the verbal and numerical description of a projected building--this problem of reducing the data to a manageable form and magnitude becomes a major problem at a large institution. There are so many square feet to deal with, that each individual case cannot be given separate attention.

Those of you whose institutions are still at the small or only middling-large stage--those of you who can therefore still look at the figures representing individual rooms, and can even look at a room number and visualize the actual room, including the colors of its walls--should strive to retain that personal contact as long as you can. Nourish it; keep it alive!

When I developed the standards used in *A Restudy of the Needs of California in Higher Education*, I still had a fairly direct, personal acquaintance with the physical circumstances of nearly all the departments on the several campuses. As nearly as I can describe the process of developing those standards, it consisted of playing around with numbers representing first approximations--sometimes out of thin air--manipulating whole sets of such numbers, somewhat as if they were simultaneous equations, until I finally had a series of statistical descriptions and evaluations that agreed with my largely subjective convictions as to the relative adequacy of the physical circumstances represented by the raw data with which I had started.

Essentially, this was a trial-and-error process of estimating per-person allocations of floor area--average square feet of each kind of room per each kind of person--which, when multiplied by the actual numbers of full-time-equivalent students and staff, would produce a computed total floor area agreeing closely with that either of a program which had been carefully developed, room by room, or of adjusted figures for an actual building. I'm not sure I could do it again!

There is no statistical substitute for direct, personal knowledge. When you do find yourself driven to the use of statistics, use them only as a notebook--a crutch supporting such personal acquaintance with real buildings and people as you are able to maintain.

What are the advantages and disadvantages of standards? Obviously, they have the advantage of enabling one to produce a quick and ready answer to the question, "How many square feet of building space will we need for such-and-such an academic program?" That's still no substitute for an itemized, detailed development of a program for the building, room by room, to house that academic program. But it is a handy way to produce a fairly reliable answer when someone insists on an answer this very afternoon, if not this morning.

The disadvantages are several. The one I'm most conscious of is the constant danger of following too long and too slavishly a given set of standards--letting them become the inviolable guide when conditions are changing. Perhaps we've already done this at the University of California; we're due, I think, for a wholesale re-evaluation of the standards by which we've been developing our building programs. If teaching methods and educational philosophies have not yet changed so much that we need to revise the physical standards, then those methods and philosophies certainly ought to change soon.

Development of a Building Program

For an individual building, one can start with an approximation developed by a mathematical application of standards, as I described in *Methods for Determining Space Needs Which Are Related to Enrollment*. This should, however, only be a point of departure. We try to use such a calculation primarily to establish the *total* floor area to be programmed, leaving considerable freedom for the planning group and the architect to work out the details within that total, and admitting also the possibility of departing from that total if the need to do so can be demonstrated.

For an entire campus--whether for a certain "target" year several years in the future, or year by year for the next few years--one is practically *driven* to the use of some kind of shorthand, statistical, best-approximation procedure. One step further--an entire multi-campus institution such as we have, or as each of several states would have if all its institutions of higher education were in one system--and then one finds himself with the problem of producing an encyclopedia. The mere typographical problem of listing all the projects--of scheduling the several phases of each project's funding, year by year, and keeping track of all the dollars--becomes something for which one turns to a punched-card machine, if not an electronic brain, because a human clerk is too slow.

In a comprehensive study of an entire large state or region, one has the problems we faced in the California *Restudy*, and are now facing again. In such studies, one is compelled to rely almost entirely, if not completely, on statistical manipulations of broad groupings of data--gross totals and subtotals. Seldom can objective measurements be used, and all too often highly subjective replies must be given to such questions as that frequently addressed to the president of institutions, "How many more students could your institution accommodate?"

Translation of a Building Program into Architectural Plans

It may help if I close with a brief description of our one happy experience of being able to program (in the physical-planning sense), room by room, all the buildings of an entire new campus on the basis of what I refer to as an academic program--a happy experience which is so unusual that I am afraid I may never have another one, if only because of the laws of probability.

The University of California's Riverside campus was, and still is, a long-established citrus experiment station of the College of Agriculture on which a Liberal Arts College was established. Our first good fortune was the appointment of the chief administrative officer, Dr. Gordon Watkins, far, far in advance of any students and even of any firm allocation of the funds to specific projects. At that time, Dr. Watkins was serving on the Railway Labor Mediation Board, and had, therefore, to spend considerable time in Chicago. Nevertheless, he somehow found time--sitting in his room in the Palmer House with his portable typewriter, using either the touch system or the seek-and-ye-shall-find method--to type what amounted to an annotated draft of the general catalog: course descriptions, expected course enrollments, desired section sizes, types of instruction (lecture, discussion, laboratory), and number of hours per week for each section.

All this was done with a 1,500-student enrollment in mind. To my knowledge, he performed no arithmetic with the numbers he set down; we, of course, did. We multiplied each course's credit value by the projected course enrollment, added all the products, divided by the appropriate factor, and then almost fainted when the sum turned out to be 1,497 full-time-equivalent students! There were a few instances of what we on the staff felt were imbalances between subject fields. By the time we had ironed those out, the total wasn't quite so close to 1,500; but it was a remarkable performance by Dr. Watkins--one that I doubt anyone will ever be able to repeat.

Of course, there turned out to be, in fact, differences between the academic program as he laid it out and what actually developed, as well as differences between the physical provisions which we made and those which became necessary. And there are now differences between what was then projected as the ultimate size and what we are now projecting.

For example, by an administrative decision in the early planning stages, it was determined that it would not be necessary to furnish research facilities in the biological sciences building of the Liberal Arts College because the Agricultural College was so well represented by its Experiment Station, research facilities of which were presumed to be available to the biological scientists of the new college. In this same connection, it was decreed that some part--probably small but nevertheless significant--of the instruction in the biological sciences could be performed by Experiment Station personnel.

Neither of those events came to pass. Consequently, the college found itself in operation with the biological scientists not provided with research facilities corresponding to those which we had for the physical scientists in the Physical Sciences Building.

Another difference that developed was in the distribution of students among subject fields. In our planning, one of the criteria that had been laid down was that we were to plan Riverside as "Berkeley and Los Angeles in miniature." We had to translate the term, "in miniature," very loosely. Obviously, for example, there was not going to be any College of Engineering at Riverside--at least, that seemed obvious then. So we had, for example, the question, "In what subject fields are the counterparts of Berkeley's and Los Angeles' engineering students going to enroll at Riverside?" Furthermore, when we had compared Gordon Watkin's catalog with those of Berkeley and Los Angeles, we had discovered that even within our one institution we were not consistent in the course numbering at the two campuses--even, in some instances, as to whether a given course was lower- or upper-division level.

In the face of such variations, we could not carry the planning completely to a course-by-course operation. However, as roughly as we were able to approach that basis, we tended to assume that the presence of the College of Agriculture--even if only in the form of the neighboring Experiment Station--would be a stimulating factor in the biological sciences. Curiously enough, just the opposite has happened. I don't mean that the biological sciences seem to have been deterred. The students have, however, flocked in great numbers to the physical sciences. The college therefore found itself in operation with a considerably greater proportion of students--student-credit-hours, FTE students, student-hours per week, or however you would choose to measure it--in the physical sciences than anyone had expected, and therefore proportionately less somewhere else. The "somewhere else" was, however, spread throughout the rest of the college, so there was no great impact on any one subject field other than the physical sciences.

The original campus planning had been on the basis of an initial physical development for 1,500 students--a figure which we had "backed into" by roughly estimating the number of students for whom the initial appropriation of about $5,300,000 would provide physical facilities at the construction costs of the day--costs which, I'm afraid, are now so long gone that we'll never see anything even faintly resembling them again! The campus master plan was based, as I recall, on an enrollment of 3,500, but with provision for ultimate expansion to 5,000. Now, however, we're faced by the necessity of planning for at least 10,000.

Despite these differences between the plan and what developed, we found ourselves in a manageable situation. The physical inequities in such respects as research facilities, even total staff facilities, have been corrected in the first series of added buildings. Some of the

Riverside people would not agree, I'm sure. But it's my conviction that we didn't fail completely. The Riverside campus not only has survived; it has, in fact, established an outstandingly fine record for an institution in its first few years of operation--fine, that is, in such terms as the percentage of graduates that have gone on into graduate work. Any mistakes we made in the physical planning could not, therefore, have been exactly fatal.

As for the campus plan itself, Mr. Evans may have time to discuss it in his lecture. He and I feel that we have a soluble problem in adapting it from a goal of 3,500 to 5,000 students to one of at least 10,000. An obvious question is, of course, the one, "How can the original plan still be workable when so many features of the college have changed?" To some extent, the answer I would give is a retraction of statements that some of you have heard me make in the past. Right now, I would attribute whatever success we've had in making physical adaptations to the fact that the original architectural planning, while admittedly not perfect, provided a high degree of flexibility and extensibility--particularly in the campus plan--to accommodate developments far beyond anything that was foreseen, or even foreseeable, by those who were doing the academic and physical planning. This was done in ways which I assume Mr. Evans will discuss this afternoon!

XIV. Space Utilization Surveys in Small Institutions

. . . . **John B. Morris**

For several years the expression, "the impending tidal wave of students," has been firmly entrenched in the vernacular of higher education. The "wave" has been considered rather autistically by most educators; but as it continues to take on characteristics of reality, we find frantic activity taking place aimed at preparing ourselves to accommodate the students. Much of this activity is concerned with physical facilities and takes the form of space surveys closely followed by building programs. These building programs are announced in the newspapers as being designed to meet the projected needs of the college as revealed by a careful survey of existing facilities. Often experts or consultants are quoted in describing present conditions and to justify the announced expansion.

The presidents of our smaller institutions are no less aware of the necessity of having objective data on which to base their decisions than are their counterparts in the large universities. However, the cost of securing consultant firms or experts to conduct comprehensive space surveys is sometimes prohibitive.

In an attempt to lessen the costs to his institution, the president in many instances selects from among his own staff or faculty an individual and informs him that he has been chosen as the chief space analyst for the institution. It is to those of you who find yourselves in this unenviable position, or have the suspicion that you may soon do so, that these remarks are addressed.

While I certainly do not pretend to the status of expert in the field of space studies, I do believe that some of the experiences I have had at several institutions have allowed me to gain some conception of the difficulties that one may expect to encounter. Accordingly, what follows represents the advice that I would give to anyone who finds himself responsible for a space utilization survey in any size institution; but I shall pay special attention to some of the difficulties peculiar to smaller institutions.

The first step is to secure a definite statement from the head of your institution that will identify the purpose of the survey. A survey that is not designed to answer some specific question or that does not yield evidence to aid in solving an existing problem may be of interest when it is completed, but its utility will certainly be low. Surveys that are not designed to answer specific questions often lead to what I call the "President's Circle." This circle is usually generated when a mass of data is presented to a chief executive who has ordered a survey without a clear purpose in mind. The usual procedure is to peruse the data, indicate slight disappointment at the space utilization rate and to suggest that the study be repeated again the following year so that comparisons can be made. As studies of this sort usually do not produce any administrative action that will produce any changes in utilization rate, the following year's study usually elicits about the same comment and by the third year the President's Circle has been well formed and the study will be done "because we usually do one every year." Presidents often boast that their institutions conduct a complete space survey each year without realizing the full implication of their remarks.

After a statement of the purpose of the survey has been received (assuming you have been successful in getting one; a somewhat tenuous assumption), for your further protection, I would suggest that you reach an agreement with your president as to the kind of information that will be accepted as an answer to the question or as an aid in the solution of the stated problem.

An insistence on your part that these two conditions be met before embarking on a survey will save you trouble in many instances and will help prevent the frustration of seeing data resulting from much hard work go unused. I might add that application of the above suggestions will at times get you excused from conducting the survey. Some presidents after thinking through these questions decide that a survey is not really needed.

Before beginning the actual survey there is one other step that should be taken that will pay large dividends in saving time and effort. You should secure from your Superintendent of Buildings and Grounds, Physical Plant Director, or similar person, current and accurate scale drawings of each building that is to be included in the survey. Each room of the building plans should have its dimensions clearly marked and the square footage computed.

I would advise you to beware of the superintendent who has partitions in his brain. By this I mean you will often find the only existing plans to be out of date and they will not properly reflect many of the minor structural changes that have been accomplished within the last few years. Don't accept plans that are "about right except for a partition we put in about here a couple of years ago." You will find that you have enough to do without having to become a draftsman during the survey.

Incidentally, you will find one of the most effective ways of presenting your results makes use of the building plans. Color codes showing the utilization rates of rooms, etc., can be easily worked out and entered on the plans. Thus, at a glance one can get a visual image of the relative efficiency with which each room or building is being utilized.

One other time-saver should be mentioned that will greatly facilitate your survey. Be certain to secure keys to all rooms that are to be included in the study. This point is especially important if faculty offices are among the rooms being studied.

I cannot overemphasize the importance of all the foregoing preliminary steps as aids in securing a picture of the scope of the work to be done and as time-savers.

The next step is the actual survey. For the purposes of this discussion I shall assume that the focus of the survey you are to undertake is classroom utilization. Indeed, this is the facet in which most interest is shown at the present time; but I hope you will remember that if the main purpose of the survey is to plan for expansion the total plant must be studied. As many surveys that have their genesis in classroom utilization grow into total institutional studies, I believe it is worthwhile to select your data gathering forms with this possibility in mind. Much time and effort will be saved if the data gathered in initial classroom studies is comparable to subsequent data gathered for other aspects of the campus and can be combined with them computationally.

In order to secure the foregoing advantages and to make use of past experiences of others, I would suggest that you carefully consider forms similar to those recommended by Russell and Doi in their _Manual for Studies of Space Utilization in Colleges and Universities_. The definitions used in this manual have become virtually the standard and the forms suggested by the collection and analysis of data are so clearly presented and explained that no one should experience difficulty in their use.

Even so, I believe you will find it worthwhile to try out the particular form you intend to use to gather data on some of your own rooms before any large scale duplication is made. Should you find they are entirely suitable, and they will be in most cases, you may start your survey with confidence. In the event that you find some modification or redefinition necessary, I would suggest that you think through the effect your change will make. Your decision to make even slight modifications should be evaluated on the basis of how well you will be able to analyze the data after it has been secured. Data, no matter how accurately compiled, that does not lend itself to meaningful analysis is useless.

If you are thoroughly satisfied that your form is acceptable, you may consider yourself ready for the survey to begin. However, you are still subject to several pitfalls that can complicate your work and incur the wrath of various faculty members.

Not the least of these difficulties will arise when you go about the business of classifying the type of room. In addition to stating the principal use of the room, one should attempt to classify it as "general purpose" (e.g., a lecture hall) or as "special purpose" (e.g. a physics lab).

It may appear obvious to you that the typical lecture room is a general purpose room and that a chemistry laboratory is a special purpose room, but woe unto the space surveyor who, without consulting the department, classifies the lecture room controlled by the Philosophy Department as a general purpose classroom. When this event occurs, you are likely to have it pointed out that the small bust of Aristotle located in the back corner of the room really signifies that this is the Philosophy laboratory and as unsuited for general purpose classification as the history room down the hall that has a map depicting Hannibal's conquests.

As a simple measure of protection, I suggest that in surveying each room you make an attempt to do so with the assistance of its principal user. In this manner you may prevent embarrassing mistakes and are not as likely to overlook specific deficiencies that the room may have. In cases in which you honestly believe the room should be properly classified as general purpose despite objections, a note to that effect can be made and the problem resolved by the administration. Lest you believe my examples to be too extreme, let me caution you to wait until you have conducted your own survey and had its results accepted before you classify them as humorous.

While the goal may be to classify all rooms in the two aforementioned categories, there is one problem that is almost peculiar to the small college that requires that a third classification be recognized. This classification, which in my own work I designate as "restricted," is made necessary by the antiquated professor of classics who has for the past forty years used the room next to his office. Typically, this is one of the more attractive rooms on the campus and contains at least forty student stations. The fact that he seldom has over four students in his advanced classes and that the utilization rate is extremely low is of no consequence; no administration dares move him out. The only hope of the space controller is that this man will accept soon his retirement that is already three years overdue. The classification, "restricted," is used to designate certain hours that this room is not available for assignment regardless of the fact that it could be more efficiently used. This category could also be called "non-assignable, general purpose space."

After you have gathered the basic data and subjected it to the usual analysis (again I would suggest that the Russell-Doi forms be closely followed), you will find yourself faced with the problem of interpretation. This problem will be compounded by the fact that you must so interpret the findings that their true nature will be immediately apparent to the naive viewer. The fact that the figures are completely clear to you cannot be used as an effective criterion as you have knowledge based upon their derivation that will not be easily communicated to your president or other official to whom you make your report. Always bear in mind the finality with which most people accept statements that are accompanied by numbers.

A technique that will greatly aid you in selecting the proper summary figures, particularly those dealing with measures of central tendency, is to make frequency distributions of your results. If you will make these distributions and inspect them carefully before deciding whether to use the mean, median, or mode as a summary figure, you are much less likely to present results that contain distortions and lead to erroneous conclusions.

Should you feel that you lack the proper technical training to make this selection, I would suggest that you consult with your mathematics department or one of your social science groups. The manner in which you present your results will have an influence on the kinds of interpretations that can be legitimately made. Make every effort to be certain that your figures properly reflect the actual conditions that obtain.

The interpretations that are to be made will be largely a function of the original purpose of the study. Thus, the importance of securing a clear statement of the purpose and the specific questions to be answered is reiterated. If the main focus of the study is on more efficient utilization of existing space, I believe that in small institutions you will discover that it is not lack of sufficient space that is the main problem but the lack of proper scheduling.

By proper scheduling I am referring to room period usage rather than percentage of student station utilization. Often space data is used in a "combinational and permutational fallacy." By this I mean that the only improvements made in scheduling are those designed to secure a larger percentage of student station untilization in each room to which a particular class may be assigned. The total number of room periods available in an academic week is not increased, but the apparent efficiency is increased by placing the ten-student class in a twenty-student-station room and the twenty-student class in the thirty-place room formerly occupied by the smaller class.

On paper this kind of maneuver brings about improvement, but it does not solve any space problems. Additional usable space can only be "created" by rescheduling classes and making greater usage of the afternoons. I believe that in most of your colleges if you would give me control of your English Department, I could produce 20 per cent more space for you. Actually, I have used English only as an example--any other department having a similar number of required courses would work as well.

John B. Morris

If one of the charges given for your survey is to plan for new buildings, you will have many things to take into consideration in drawing conclusions from your data. For example, the problem of what size rooms should be constructed in the new building will have to take more into consideration than the average or most popular size class revealed by your survey. Of equal importance will be the particular educational philosophy to be subscribed to in the future regarding the size of instructional unit and the financial outlook of the institution. None of your interpretations and/or recommendations will arise as easily as I have stated here, but I did want to mention some of the factors that are often overlooked.

I hope that I have not been discouraging. Time has not permitted anything approaching a full discussion of a "do it yourself" survey. All I have attempted to do is to mention a few pointers that should be of aid in preventing difficulties that others have had.

I'll close with one further point. You must be prepared to accept part of the responsibility for actions that are taken or the lack of action that follows space surveys. It is impossible to conduct a good survey without the knowledge of your faculty. They will expect to see action result from the study, and the focus of their requests will usually be the space surveyor. Good luck!

XV. Campus Planning

Robert J. Evans

As a prelude to more specific remarks, I would like to review for a few minutes the nature of a university and explore the lessons that history can teach us. For this I am drawing heavily on research undertaken by us with our Planning Consultants, Pereira and Luckman, during a recent study for the selection of sites for new campuses.

History of the University

The idea or concept of a "university" is one of the greatest inventions of Western culture and one of the most diffuse--a community of learned men and a body of scholarly aspirants, linked to society at large by bonds that are highly valued but rarely defined. The university has led the thoughts and philosophies of its time. It has advanced new ideas of men through pure research, and has served as a sanctuary for thoughts and words of the best thinkers and intellects that history provided, regardless of language or race.

Cardinal Newman, writing in 1856, supplied this eloquent answer to the question, "What is a university?":

> If we would know what a university is, considered in its elementary idea, we must betake ourselves to the first and most celebrated home of European literature and source of European civilization, to the bright and beautiful Athens--Athens, whose schools drew to her bosom and then sent back to the business of life, the youth of the Western World for a long thousand years.
>
> Hither, then, as to a sort of idea land, where all archetypes of the great and fair were found in substantial being, and all departments of truth explored, majestically enthroned as in a royal court, where there was no sovereignty but that of mind, and no nobility but that of genius, where professors were rulers and princes did homage, hither flocked continually from the very corners of the _orbis terrarum_, the many-tongued generation, just rising, or just risen into manhood, to gain wisdom.

Although it was conceived in Athens, the "university" as we know it originated in medieval times in Europe as a guild or corporation of teachers and scholars, banded together for security and protection against interference from political, ecclesiastical or civil authorities. It was not designed as a means of popular education but was for the training of clerics, statesmen, doctors of law and medicine. A degree was simply a license to teach. The Universities of Paris, Bologna and Oxford arose spontaneously in the course of the 12th and 13th centuries in locations where there were existing religious schools or other traditional centers of instruction.

For a long time those early Universities possessed no buildings of their own. Congregations or great public gatherings were held in a church or public building that was borrowed or rented.

Finally, toward the end of the 15th century, there began a movement toward the establishment of the true university in which all faculties were located together in a single building. At that time, particularly in Italy, the university was beginning to be looked upon as a state institution. Thus in 1492 at Pisa we find the corn exchange being turned into a great university building by Lorenzo de Medici.

Originally the students lived where they pleased, and the undisciplined swarm of rowdy and irresponsible youths from 14 upwards frequently caused trouble for city authorities. Some took common-houses which one of them managed for the rest. Still later, wealthy patrons began to endow hostels called "colleges" for poor deserving scholars (the birth of the Sorbonne).

Teachers who up to that time had been unpaid (except for a "collecta" contributed by the students) and who had no fixed place to live or lecture, now began to use the colleges for both purposes. Faculties became permanent groups, and something more like the residential college system, which still exists today at Oxford and Cambridge, came into being.

Another way in which universities developed during the Middle Ages was by migration of students from one seat of learning to another. Cambridge appeared as a result of migration from Oxford in 1209. The great University of Padua (1222) was started by an exodus of dissatisfied students from Bologna, unhappy with their treatment at the hands of the city government. (Bologna could well afford the loss, since it is said to have had 10,000 students at one time.) Students from Padua were, in turn, persuaded to migrate and establish a new university at Vercelli, where the community was more accommodating and offered houses, books, copyists, provisions, salaries for professors, and a promotional program.

After the first universities had been established the most common way in which new universities came into being was by deliberate foundation, the motives being various: to combat heresy; to increase national, political or personal prestige; to encourage local prosperity.

The American college dates back to colonial times, the earliest being Harvard in 1636, endowed by John Harvard as a center for training future clergymen "dreading to leave an illiterate ministry to the church when our ministers shall lie in their graves."

While nine similar institutions were founded prior to 1776--all but one by religious denominations--others were soon founded by whole communities, or by farsighted philanthropic individuals. The writings of Jefferson, Madison and Daniel Webster are full of demands for the rapid extension of free public education, from the elementary school to the university, in line with their feelings that democracy could not survive unless its electorate had a maximum of educational opportunity. Thomas Jefferson sponsored the foundation of the University of Virginia (1819) as a token of his faith.

After the Revolutionary War some American colleges assumed the role of universities combining "schools of liberal arts and sciences, professional schools, and graduate schools providing programs for study and research beyond the level of Bachelor's and first professional degrees."

With the establishment of state universities and especially with the coming of the land grant colleges, public support and public control began to play an increasingly important role in American higher education. You are all fully aware of the more contemporary developments: higher proportion of students; longer and higher education; the melding of traditional disciplines; and the evolution of a new profession, research.

The university of today seems to be completely illogical--inexplicably, inextricably intertwingled--defying the organization chart. How then can we be expected to do a logical and efficient physical plan?

The answer may be that we cannot, in precise terms. Or it may be that in some instances the physical plan must be the leader, providing creatively and imaginatively for the possibility of things yet to come--yet unknown.

Qualities of Great Universities in the Past

To aid us in our future planning we must recognize those elements that were shared by the great universities in the past.

1. Greatness of a university depended first and foremost on its teachers. There never has been a truly great university without men of high intellect and wisdom among its faculty.

2. Gifted students were an essential component. However, it should be noted that they were naturally attracted by a strong faculty. It appears further evident that these qualities fed on themselves;

once having gained a reputation, the institution became a magnet, attracting other gifted scholars and students.

3. Urban Environment

   All through history it has been in the cities that great universities have arisen or, conversely, cities have arisen around great universities. The traditions and atmosphere of one enriched the other and eventually they became bound together.

4. Internationality

   As it was at Athens, students and teachers from many nations seemed to be a common bond among great universities.

5. Residency

   Another characteristic shared by the great universities was that their students lived as closely as possible to the campus, to the faculty, and to one another. The students who attended universities in Europe and the New World lived in residence halls, or colleges, took lodgings in the city or lived within easy distance of the intellectual and social and recreational centers of both the city and the university. Undoubtedly, living within a university community enriched a student's life and accelerated the educational process.

Growth Patterns of Universities

One other element that should be observed from history in order to guide our future thinking, is the pattern of growth of universities.

Most universities found through the passage of time that their original sites were too small. From the beginning of the 19th century on--with almost no let up--the violent expansion of both universities and cities used up all the lands adjacent to the university core. The university became overcrowded and cramped. Industrialization caused unfavorable changes in the character of the surroundings.

In coping with these problems, the universities' methods followed one of several distinct patterns.

1. New buildings were spread throughout the city (Yale).
2. Some function or branch was moved to another site or city (Duke, Michigan).
3. The whole university was moved to another site (University of Mexico, University of Rome). Unfortunately, in some such cases the university was merely dumped on the outskirts of the town and allowed to be surrounded again by an arbitrary mixture of multiple land uses (Glasgow).

4. Vertical Expansion was achieved. Where advantages of remaining within the city outweighed the need for additional space, vertical expansion resulted (Pittsburg).

5. The existing site was expanded by acquisition or condemnation of other land adjacent to original site (Wayne, U. C., Berkeley).

6. Limitation of Enrollment. A few private colleges, such as Amherst, have been able to control their physical growth by limiting enrollments; such an option is generally not available to publicly-supported institutions.

A striking exception to the growth pattern is here around us--Stanford. While I am certain there have been times in the past when the University staff cursed their heritage, feeling frustrated or isolated, the great wisdom and farsightedness of Leland Stanford in bequeathing 9000 acres "never to be sold" is proving a God-send. Today Stanford is able to accommodate the contemporary University, including massive nuclear research facilities and to permit selective intrusion of compatible industry and health science facilities that would otherwise have been impossible.

From the review of history, it is obvious that we are working with nothing new. The problems we face, those of constant change in both size and complexity, are of our own making; they are the product of the university itself, of our national educational policies and of the accelerating rate of growth in all fields of knowledge. This necessity for growth was perhaps best expressed by our past President Robert Gordon Sproul at Berkeley's Commencement in 1957:

> Implicit in the very nature of universities is the belief that the past is a guide but not a commandment, that the present is a plateau and not a mountain top, and that the future belongs only to individuals, institutions and societies that have in them the capacity to grow... This is the law of life as I see it. The future belongs not to the rigid absolutes, whether these be primary rocks or unyielding social arrangements, but to things that can grow.
>
> Here lies the reason why universities which are rooted in the principle of growth and peculiarly adaptable to new concepts have been for centuries the flower of every civilization, and are still the best hope of mankind.
>
> Imbedded in no system of regimented axioms, their conviction is that the thrust of events is steadily forward, and that frontiers are never stationary.

Certainly one feeling a person gets from reviewing the history and the nature of the university is: "Why don't we build some temporary shacks that we can tear down or abandon to accommodate the inevitable change? Let's save the money and not worry about the future."

Personally, I can't be that much of a defeatist! In today's world the other end of the log is not an adequate laboratory for learning and there are neither sufficient teachers nor logs to do the job. I believe we have an obligation to create an environment that is dignified, enduring and beautiful--a place that will foster and inspire intellectual and social contact, preserve tradition, and develop the prestige the institution warrants. Such an environment cannot be accomplished with "temporary" buildings and a "live for today!" attitude.

One cannot deny that environment has a strong but subtle influence on the development of character. As Winston Churchill once said "We shape our cities and then our cities shape us."

Campus Planning

Adequate physical facilities and careful planning of each campus are essential to the realization of the academic program. If physical planning does not keep pace with academic planning, inefficiency, dissatisfaction and frustration will result. It is not uncommon to find that creative and imaginative physical planning will stimulate coordinated academic planning. Obviously, with such a fluid program as is characteristic of a university, not one plan but continuous academic and physical planning is required.

I will use the University of California as a case for discussion not only because I am most familiar with it, but because it possesses a wide range of the types of problems usually encountered.

The problem most of you face is undoubtedly that of redevelopment; trying to expand and alter existing facilities to meet the requirements of today and anticipate those of tomorrow. The Berkeley campus has had this problem many times.

The site was chosen in 1858 "because of the abundant water supply, the absence of severe winds, the rolling landscape, a superb view toward the Golden Gate and the rather convenient but not pressing proximity of Oakland and San Francisco--and the fact that 140 acres of land could be acquired immediately."

The development of the campus through the years was guided by many great plans: the Frederick Law Olmstead Plan in 1866; the David Farquahrson Benard Plan in 1898 which resulted from the Hearst International Architectural Competition; the John Galen Howard Plan in 1908; and the Arthur Brown, Jr. Plan in 1944.

Post-war enrollments and newly emerging educational patterns made it apparent in 1944-45 that we were developing "plans" without being truly planned. There was no internal mechanism for establishing policies; academic programs were not geared to the future, and we had no standards by which we could measure our efficiency of utilization or our needs for space.

We inaugurated a program of comprehensive planning with participation by faculty, administration and professional staff. The resulting report, in December 1951, established a new guide for the growth of the campus to 20,000 students and created a long-range land acquisition program necessary to implement the plan. This comprehensive planning approach has been refined and effectively continued to newer and greater horizons.

The Los Angeles campus illustrates some of the problems inherent in a very rapid growth situation. Several types of plans have been used there in response to rapidly changing needs and policies. In contrast to the Berkeley campus which developed slowly, and at a time in which the surrounding community changed from large single-family dwellings to boarding houses, to apartment houses, to such deterioration that redevelopment was feasible, the Los Angeles campus is ringed by high quality residential facilities, making expansion of site impractical.

Lack of nearby housing facilities for students, faculty and staff and lack of adequate public transit systems produced undesirable "day school" patterns and almost inconceivable traffic and parking problems. These are currently being overcome by provision for student housing on campus and a bold attack on the circulation and parking problems.

Our Davis campus, founded in 1908 as a branch of the College of Agriculture, is now destined to be a full general campus of 10,000 students. Despite its 3000-acre campus, the problems of redevelopment to accommodate its new mission are enormous. The academic core of the campus is established immediately adjacent to the City of Davis, thus making uniform centrifugal expansion impractical. Some major surgery will be necessary in order to re-establish academic relationships within the ten-minute class change period.

Our Medical Center in San Francisco provides teaching facilities for medicine, pharmacy, dentistry and nursing and vast research facilities in all of the Health Sciences. The site on the steep slopes of Mount Sutro is limited and congested. Redevelopment to meet the ever growing and changing demands poses unique and complex problems. Progress to date reminds one of the story of the church in need of a new and larger building. The governing board resolved that the new church should be built on the site of the old one; that it should be built out of the materials of the old church; and further, that services would be continued in the old church until the new one was completed.

The growth and development of the campuses at Mt. Hamilton, Santa Barbara, Riverside and La Jolla further illustrate the wide variety of problems inherent in expansion and redevelopment.

New Campuses

Ultimately, growth requirements cannot be met by expansion of existing campuses. (The "elastic limit" is an excellent subject for self-study and institutional research.)

A 1956 "Study of Need for Additional Centers of Public Higher Education in California" led to the determination to establish three new campuses of the University. For each campus, the 1970 enrollment demand was forecast, and the general location in the State was established.

What a tremendous challenge! What kind of site do we need? How big? Where? How do we head off the pitfalls observed from past experience? How can we prevent an expedient or political determination? While the problem was unique to us, it became clear that its solution could be achieved in essentially the same way we acquire new buildings:

(a) A program of requirements had to be established; (b) a professional architect-planner was retained to explore and evaluate the possible solutions; (c) a comprehensive and factual analysis of each prospective site was undertaken to eliminate as far as practicable the hazard of a purely expedient or political determination.

The programming effort resulted in the "Criteria for the Selection of New Campus Sites for the University of California." I will not go into it other than to say that it establishes the physical requirements, touches upon the emotional or aesthetic desiderata, and discusses the human interaction potential in a University community.

Consultants retained for the site studies were Pereira and Luckman for Southern California and Livingston and Warnecke for Northern California. These firms contributed additional research to enlarge upon and clarify the "Criteria," in the following areas: "The history of university growth patterns" (as previously presented), "Student employment patterns and requirements," "The effect of proximity to other institutions of higher learning" and "Methods of controlling land uses and development standards adjacent to a campus."

The results of our site selection efforts to date have been more than gratifying. The demanding requirements and the creative and visionary approach have been infectious to the point that they have brought forth the creation of plans for entirely new cities centered around the University of the Future.

For instance, a plan and report has been prepared by the City of San Diego for the development of a new University Community. The plan provides for major changes in the road and freeway network, the establishment of a convenient town center, a wide variety of housing types to accommodate the needs characteristic of a university, recreational facilities and compatible industrial research and development plants.

This represents the first time to my knowledge that collaborative planning, arts, skills, science and effort have been directed towards the location of a new university campus. It has been a rewarding experience to date, and we can only pray that we have laid the foundation for a successful, modern University City. One thing is sure--to quote John Galen Howard upon completion of his Berkeley Plan--"Future generations will consider themselves bound by our preparations to the extent, and only to the extent, that we have foreseen their needs and have planned wisely for them."

Robert J. Evans

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Special Lectures

XVI. The Program of the Center for the Study of Higher Education

. . . . T. R. McConnell

The report of the Center for the Study of Higher Education for 1956-58 described an extensive series of investigations under the general title "The Diversification of American Higher Education." Work on these investigations has continued during 1958-59. The status of these studies may be summarized as follows:

1. The selectivity at point of intake of American higher education as a whole.

   This investigation has been completed and will constitute one chapter in a forthcoming monograph on student selection and survival.

2. Intensive studies of college-going and academic survival in selected states.

   These studies were directed by Dean John G. Darley, of the University of Minnesota, with the collaboration of Dr. L. E. Drake, of the University of Wisconsin; Dr. H. T. Manuel, of the University of Texas; Dr. Frank M. Fletcher, of The Ohio State University; and others. The investigations provided information on the levels of ability and high school scholarship, the socio-economic backgrounds, and educational and vocational motivations of students who attended particular institutions and groups of institutions in the states under study. The same factors were related to academic survival.

   The results of these intensive state-wide studies and the data from the nation-wide sample will be incorporated in a monograph which will be completed by Dean Darley during the summer of 1959 and submitted for publication soon thereafter.

3. Junior college studies.

   a. The report of Dr. Leland L. Medsker's survey of junior college education in some 70 two-year institutions in 15 states was completed, and the manuscript has been submitted to McGraw-Hill for publication. The survey data were incorporated in a broad evaluation of widely accepted functions of the junior college. The published volume, therefore, will serve as a complete review of the place of the junior college in a diversified system of higher education.

b. Dr. Burton R. Clark's sociological study of the development of the San Jose Junior College was completed, and the manuscript of a volume incorporating his findings was submitted to McGraw-Hill for publication. This investigation was concerned with the problems a new college experienced in finding its place in a community in which there is a strong program of vocational education in the high school, in which a state college is located, and from which many students go to other outstanding four-year institutions in the area. Dr. Clark's report will be a valuable contribution to the relatively new field of institutional analysis as well as to the field of junior college education.

4. The state-wide coordination of higher education.

Dr. Lyman Glenny's book on the Autonomy of Public Colleges: The Challenge of Coordination, which resulted from his investigation of coordination in 12 states, was published in June by McGraw-Hill. Like the Medsker volume, this book appears at an opportune time in the development of American higher education, for coordinating agencies have recently been established or are currently being considered in several states. Dr. Glenny's study is both descriptive and evaluative, and should be of great assistance not only when new coordinating agencies are established but also when previously created ones wish to appraise their purposes and operations.

5. Studies of student characteristics in undergraduate colleges and professional schools.

The intensive studies of the characteristics of National Merit Scholarship winners and runners-up of 1956 continued. One of the purposes of the study of National Merit Scholarship students was to test the hypothesis that higher institutions are not only differentially selective with respect to academic aptitude but also with respect to significant characteristics of personality. A second purpose was to determine the relationship of certain measured personality characteristics to choice of field of specialization and vocation, professed attitudes and values, and academic attainment. Several papers on these subjects are in process of preparation by Dr. Paul Heist and other members of the research staff.

The study of NMS students includes changes in attitudes, values, and personality characteristics. It is possible at present to assess changes between the end of their freshman and the end of their sophomore year. The personality inventory and the questionnaire covering attitudes, beliefs, and values were administered again at the end of the students' third year of college (in the spring of 1959) and will be given at the end of the senior year. The "pencil and paper" instruments will be supplemented in the spring of 1960 by interviews with a selected group of students.

Ultimately, therefore, it will be possible to assess the changes that take place among an unusually gifted group of students during their college careers. More extensive information of this sort will be available from the NMS study than has been secured to date. The longitudinal phase of the NMS study is in charge of Dr. Fred Tyler.

The studies of characteristics of students in selected medical schools and dental schools are approaching completion. One of the first publications on the differential selectivity of medical schools, again not only with respect to academic aptitude but also with respect to characteristics of personality, will appear under the authorship of Dr. Helen Gee, Director of Research, of the Association of American Medical Colleges, in a volume of papers given at the conference on problems of college selection and admission held recently under the Center's auspices.

A report of the dental school study is being prepared by Dr. Paul Heist, and probably will reach journal publication in the fall of 1959.

Progress has been made on several new studies as follows:

1. The study of differential selectivity and institutional impact in selected colleges.

    This study was started at the beginning of the fall semester, 1958, in Antioch, Reed, San Francisco State, and Swarthmore colleges. The design represents the convergence of many lines of interest and research, of which the following are only a few:

    a. As indicated above, work at the Center for the Study of Higher Education has shown that colleges and universities are differentially selective not only with respect to academic aptitude and ability but also with respect to what are sometimes called non-cognitive or non-intellective characteristics as well; that is, characteristics such as interests, personality characteristics, and intellectual orientation or disposition.

    b. The Williams studies at Cornell University have revealed that the student bodies of higher institutions may differ considerably in culturally induced attitudes and beliefs.

    c. Stern, Stein, and Bloom have shown that certain personality characteristics condition students' academic behavior and that students with different personality characteristics may respond quite differently to formal instruction.

T. R. McConnell

d. Sociologists have explored the effects of different levels of education on a wide variety of attitudes, beliefs, and values, as well as the influence of social status on behavioral development.

e. In a monograph that has been rather widely criticized, Jacob, after reviewing a large number of studies of student development during the college years, concluded that colleges do not make much difference in students' attitudes, values, and beliefs, except, perhaps, small colleges with a distinctive climate or atmosphere.

f. Sanford's Vassar study, on the other hand, indicated that significant changes in personality structure took place over four years.

g. Sociologists lately have turned to institutional analysis and, perhaps, are ready now to devise fruitful means of characterizing institutions, both as wholes and as constellations of subcultures.

h. The Social Science Research Council concluded some time ago that the study of personality and the study of institutional culture are most effective in combination and that the most productive means of studying the impact of institutions on students of known characteristics would be to pool the scholarly resources of psychologists and sociologists.

Three of the colleges involved in the Center's study of student development are small, highly selective liberal arts colleges; the fourth is a large and relatively heterogeneous institution so far as student characteristics and educational program are concerned. It is the intention to study the differential characteristics of the student bodies of these institutions, to study the characteristics of the colleges themselves, and to attempt to determine the ways in which each institution makes an impact on its students. The design of the project will enable the staff to study the development of students of similar characteristics in dissimilar college environments and the development of students with dissimilar characteristics in the "same" college environment.

This is probably the most ambitious study of student development over the college years now under way. As such, it has been of particular interest to the Committee on Personality Development in Youth of the Social Science Research Council. The Council recently gave the Center a small grant to enable it to expand the number of institutions in which changes in student characteristics over four years will be investigated. The students in these institutions will not be studied as intensively as those in the original four, but data from the latter will be more meaningful in the light of knowledge of student characteristics and changes in other kinds of institutions. At this time, the University of California, the College of the Pacific, the University of Portland, and St. Olaf College have agreed to participate.

2. A study of the factors related to college attendance of high school graduates of varying socio-economic and ability levels.

This investigation was made possible by a three-year grant from the U.S. Office of Education and is directed by Dr. Leland L. Medsker, with the cooperation of Dr. Burton Clark and Dr. Martin Trow.

This study seeks data on such questions as the following: To what extent is America utilizing the talents of its high school graduates? What are the factors related to the number of young people who enter college: to what extent is college attendance related to students' socio-economic status? the educational background of their families, the educational plans of their peers? their mental ability, educational and vocational motivation, and personality characteristics? their perception of the importance of college and their image of different types of colleges? their knowledge of the occupational world and the educational requirements of various occupations? How is the presence of different types of local public colleges related to the number of high school graduates of different socio-economic and ability levels who enter college and who make satisfactory academic progress?

High schools and colleges in 16 communities--14 in the Middle West and two in California--and more than 11,000 June, 1959, high school graduates in these communities are involved in the study.* Each of the communities has a population of at least 25,000, and all have similar industrial and cultural characteristics. Information about each graduate and his family will be assembled from tests and questionnaires administered in 37 public and parochial high schools and from the school records. In early October, 1959, the high schools will assist in a follow-up of the June graduates to determine which entered college, and the kind of

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*The participating communities are:

Hutchinson, Kansas
Joplin, Missouri
Springfield, Missouri
Danville, Illinois
Muncie, Indiana
Eau Claire, Wisconsin
Racine, Wisconsin
Freeport, Illinois
Kalamazoo, Michigan
South Bend, Indiana
Port Huron, Michigan
Zanesville, Ohio
Lorain, Ohio
Altoona, Pennsylvania
Bakersfield, California
San Francisco, California

college they entered, as well as what the graduates who did not enter college are doing. It will thus be possible to identify the characteristics of graduates entering various types of colleges as well as the characteristics of those who do not go on.

One important aspect of the study is to determine the extent to which the existence of local public colleges in a community is related to the proportion and the types of graduates who go to college. The participating communities include four in which there are public junior colleges, four which have two-year extension centers or branches of public universities, and four in which there are state colleges that draw heavily from the local community. Two of the communities have no collegiate institutions of any kind. It will be possible to determine how representatively each type of local college draws students from its own community. At the same time, it will be possible to compare the proportion of high school graduates, by various categories, who enter college in communities in which there are no public colleges with the proportion who enter when public institutions are available.

The influence of the three types of local colleges will be further indicated by a study of the academic performance and persistence of local students over a one-year period.

Confidential reports will be made available to each participating high school and college on its own students, but the names of individual high schools and colleges will not be identified in published reports and summaries.

Although most of the colleges in the study are in the Midwest, two California communities were chosen for comparative purposes. For example, Bakersfield was included because it represents a community which has a junior college of long standing in a state in which the tuition-free junior college is both prevalent and widely accepted. San Francisco was included because it has multiple public collegiate institutions, including a public junior college, a public state college, and a nearby public university.

Studies of the socio-economic background, academic achievement, and academic aptitude of college students are numerous. Relatively few comprehensive studies exist, however, of the factors related to college attendance of entire high school graduating classes. Few studies exist, furthermore, of the relationship of locally available post-high-school institutions to college attendance of students in varying socio-economic and cultural backgrounds and of varying academic abilities. Dr. Medsker's study is an attempt to provide such data in widely separated but somewhat comparable communities across the country.

3. The sociological study of a professional group: the junior college instructor.

The completion of this study by Dr. Herbert Maccoby was made possible by a grant of $12,316 from the Russell Sage Foundation. It is an investigation of the social personality of the junior college instructor--his social origins, educational background, professional orientation, career pattern, self-image, group affiliations, political behavior, way of life. In effect, the study describes some of the social conditions and non-occupational consequences associated with junior college teaching as an occupation. The description will differentiate between teachers and administrators, among the academic disciplines, and among the several administrative control types represented in the sample. The study is based on extensive data gathered by the Center on approximately 3500 junior college teachers in 74 two-year colleges located throughout the nation.

Much of the exploratory work on the treatment of the data--procedures, format, analytical categories--has been completed. Many of the preliminary tabulations of the data for most of the chapters have been made and, in part, briefly analyzed. Two chapters are in partial draft, with their writing serving as a means for refining and reformulating the theoretical framework for the study as a whole. Still to be determined are some of the subsidiary theories around which individual chapters will be written.

4. Several doctoral dissertations based upon data from the studies summarized above are in process and will be reported at a later time.

The Center for the Study of Higher Education and the Field Service Center of the School of Education jointly sponsored a conference on college selection and educational differentiation on May 25, 26, and 27, 1959. This was an invitational conference attended by directors of admission in private colleges and universities in the western area and by psychologists and sociologists interested in research on differential selection and on educational differentiation after admission. A large part of the program was composed of papers presented by staff members of the Center for the Study of Higher Education and the Institute for Personality Assessment and Research. The other local speaker was Dr. Herman Spindt, Director of Admissions and of the Office of Relations with Schools of the University of California. Outside speakers were: Drs. David Riesman, Paul Horst, Joshua Fishman, Helen Gee, and S. A. Kendrick.

The papers will be published as a monograph. The full program is attached herewith.

The Center aided several faculty members in research bearing on the problems of higher education. Those receiving support in 1958-59 were Drs. Hanan Selvin, Lawrence Stewart, and Sarnoff Mednick.

T. R. McConnell

Staff

The principal research staff of the Center during 1958-59 was as follows: Drs. Burton Clark, Paul Heist, Herbert Maccoby, Leland Medsker, Martin Trow, Fred T. Tyler, Harold Webster, and T. R. McConnell. Dr. John Darley served as consultant. At various times the staff included a considerable number of research assistants and clerical assistants.

Members of the staff engaged in a variety of professional activities during the year. Their publications and addresses are summarized below:

Burton R. Clark: Education as a Mass Enterprise: A Sociological Study of a Junior College, to be published in the Carnegie series in education by McGraw-Hill Book Company (manuscript submitted).

The Marginality of Adult Education, Notes and Essays on Education for Adults, No. 20, Center for the Study of Liberal Education for Adults, Chicago, June, 1958.

Paul Heist: "Implications from Recent Research on College Students," Journal of NAWDC, 22, No. 3, April, 1959, 116-124.

"Do Students Make the College?" (with T. R. McConnell) in College and University (in press).

"The Diversified Student Population in American Higher Education," a paper presented at the American Psychological symposium on the social psychology of higher education.

"Differential Characteristics of Student Bodies with Implications for Selection of Undergraduates" (with Harold Webster), a paper presented at the Conference on Selection and Educational Differentiation, Berkeley.

"Pairing Students and Institutions" (with T. R. McConnell), a paper presented at the American Personnel and Guidance Association symposium on admission policies to serve the needs of the community.

Herbert Maccoby: "The Differential Political Activity of Participants in a Voluntary Association," American Sociological Review, Vol. 23, No. 5 (October, 1958).

"Controversy and the Academic Mind," a paper presented at the American Sociological Society Annual Meeting, August, 1958.

Leland L. Medsker: "The Teaching Profession and the Public Junior College," NEA Journal, Winter, 1958.

"Preparation for Business in Junior Colleges," chapter 23 in Education of American Businessmen--A Study of University-College Programs in Business Administration. Book is to be published by McGraw-Hill and is now in process.

The Two-Year College in a System of Diversity (tentative title), to be published by McGraw-Hill in the Carnegie series in education (manuscript submitted).

Martin Trow: "Small Businessmen, Political Tolerance, and Support for McCarthy," American Journal of Sociology, November, 1958.

Right-Wing Radicalism and Political Intolerance (revised version of doctoral dissertation). Forthcoming from Free Press.

Prepared reviews for the American Journal of Sociology and the Administrative Science Quarterly.

"Some Implications of the Social Origins of Engineers," a paper presented at the meeting of the American Association for the Advancement of Science, December, 1958.

Fred T. Tyler: "An Empirical Study of the Comparability of Factor Structure When Unities and Communality Estimates are Used" (with William B. Michael) in Educational and Psychological Measurement, Vol. 8, pp. 347-354.

Harold Webster: "Changes in Attitudes During College," Journal of Educational Psychology, June, 1958.

"Mechanized Decisions and Human Problems," The Humanist, No. 6, 1958.

"A Generalization of Kuder-Richardson Reliability Formula 21," Educational and Psychological Measurement (in press).

"A Forced Choice Figure Preference Test Based on Factorial Design," Educational and Psychological Measurement, Spring, 1959.

"The Effects of College Education on Personality," paper read at the Annual Meeting of Pi Lambda Theta, National Educational Honorary Sorority, April 11, 1959.

"Construction of a Multiple Trait Personality Test for Use with College Populations," with Paul Heist, an interim research report for the Social Science Research Council.

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XVII. Some Observations on American Higher Education

. . . . **Donald G. MacRae**

I would like to warn you about the title. There are certain kinds of titles of which you should always be suspicious. In England, whenever anyone is asked to talk on the future of some subject, for example, you can be quite certain he will talk about nothing else but the past of this particular topic, usually beginning with the immortal words, "In the middle ages...," and never even reaching the present.

I'm supposed to be talking about some aspects of American higher education. Now if I talk about this at all (and I hope later on that I really will talk about this) what I say will be based on very limited experience. It is autobiographical; but I don't think autobiography is always without value.

I must begin by saying something aboutthe background from which I come, because otherwise my comments will not make sense. They may not make sense anyhow, but that's another thing.

The University

To me, and, I think, to many of my colleagues in the world of British higher education, the university (and it's only about the university I am really going to talk) symbolizes basically the same thing that it symbolizes in the United States, but the overtones and the emphasis are rather different.

To me a university is, in the first place, a society of learned men and women. It has many functions. It has the function of preserving knowledge. Knowledge cannot be learned merely from books; it can only be learned properly in terms of certain kinds of tradition, in the transmission of certain kinds of "know-how" (to use what I believe is an American phrase). I think that this is the heart of the matter; the university, first of all, is a society of learned men and women who are concerned with preserving knowledge. This preservation inevitably involves the transmission of knowledge, and, however important it may be, it is the function of the university to extend knowledge, to be concerned with research.

I know there is nothing more misleading than the etymology of words. But most of us think of the word "university" casually enough as meaning something like "universe," "universal"--and other words of that sort. That, of course, is not correct. The word "university," the word "universitas" is associated correctly with the idea of a guild, of a society of people commanding specific skills, specific "know-how," if you like. Many of the university ceremonies, absurd enough, perhaps, but picturesque enough, too, have been derived directly from ceremonies not unlike those in which somebody was admitted into the membership of any craft guild or trade guild.

What I'm trying to say is this: I see the university not in terms, first of all, of its function educationally, though I think that is of tremendous importance, but in terms of its providing the atmosphere and circumstances in which a society of the learned, and the communication--the communion, even--of the learned is possible.

Universities are all sorts of other things. Universities are actually places in which--I mean, to take one of their perfectly important and legitimate functions--after all, they're places where young men and women meet each other, fall in love, and quite often get married. That's a perfectly reasonable function of universities.

The British Tradition

I have worked in universities on the African continent and I have been very struck by something there. I don't know what you first do when you make a new university in the United States--what buildings, what bricks and mortar are first applied. But I think I'm correct in saying the first two buildings to go up in all universities in the British tradition are the following: the senior common room and the library. The senior common room or "college club" or "university club" (or whatever it may be called) is where people meet together and to which everyone automatically belongs. Other accommodations, lecture rooms and laboratories, come after these two. Administrative buildings, if I may mention the fact, are very far down the list.

Now this tradition also, and I think this follows from what I have said in my reference to the medieval guilds, is one in which the university is essentially run by its faculty, in which the universities are essentially syndicalist. (There is a certain association of the word "syndicalist" with the idea of criminal syndicalism--which perhaps is not inappropriate, because universities, whether they like it or not, cannot avoid being distrubing and, in some sense of the word, revolutionary bodies.)

Syndicalism does not necessarily mean that the whole faculty or the whole staff really run the university. Quite the contrary. Many British universities are oligarchies, run by the body of full professors. I suppose you would describe a full professor in most British universities--this is not quite correct but its the nearest thing I can say briefly--as being somewhat like a permanent chairman of a department in an American university.

Now, it may be an oligarchy of full professors, or it may, too, be a fairly genuine democracy, though, of course, experience and higher income and knowledge of the techniques of manipulation are all important to temper this. But basically, every member of the teaching staff in a British university finds himself, sooner or later, (and sooner rather than later), involved in administration; not just in the administration of his own little department but, unless he is very kind or very selfish or very stupid, or some combination of these, in the administration of the teaching body as a whole. One result of this is that in British universities the actual ratio of full-time administrators to the total senior staff of the university is much smaller than in American universities. I have tried to do calculations about this but I do not really believe the terms are capable of translation into each other.

Now, more on the tradition from which I come. Our universities are of many different kinds. Their formal constitutions are extraordinarily different. It is usual to distinguish Oxford and Cambridge and the provincial universities of England from each other, calling the first lot Oxbridge and the second lot Red Brick. Then there is the special case of the University of London and then, quite different from these, there are the Scottish universities.

I don't want to make that distinction. I want to distinguish, though, between what I am going to call "federal universities" and "unitary universities" since I think that is more important. The federal universities in Britain are Oxford and Cambridge, which consist of many colleges (and in which visitors have been known to wander until their whitened bones were found in some side street, looking for *the* university, not knowing the university isn't there--there are only the colleges); London, which has some 22,000 to 30,000 students, depending on the basis of calculation, and consisting of some 68 different teaching bodies; and, on a smaller scale, the Universities of St. Andrew in Scotland, and Durham and Newcastle in England. These are federal universities, made up on a segmentary plan not unlike the Federal Constitution of the United States. The others, Bristol, Birmingham, Leeds, and the rest, are unitary universities, and there are very real differences between the two.

On the whole, syndicalism is the case in all of them--the syndicalism of the faculty--but this is to be found in its most democratic form in the federal universities. This is generalization again with exceptions, but I can't go on saying that; assume that there are always exceptions and that no statement is true about English life without exceptions. Probably no statement is ever true of life at all without exceptions and I'll stop putting in these qualifying clauses.

Now, these universities are not to be understood as representing a group of private or public universities. Universities in Britain are neither private nor public. They occupy an interesting intermediate status. And I think I can explain this best, if I may, by turning to, after all, the very central question in the life of every university, the question of finance. British universities draw their money from four main sources:

> (1) from their own investments, which may be very considerable. For example, certain colleges in Oxford with only some three or four hundred undergraduates, are wealthier than the four Scottish universities with nearly 20,000 undergraduates;
>
> (2) from the fees of students. This is a diminishing resource and varies in importance from place to place, but is still considerable;
>
> (3) I will elaborate on this in a moment--from a curious body established by the Government but not really responsible to the Government, called the University Grants Commission--the UGC as I shall call it from now on; and
>
> (4) in certain cases, from local sources of income, particularly the field of local government, but also from local business or even, in one or two cases, funds from local trade union organizations.

All universities are financed from all four of these sources. The university is neither a public nor yet a private institution in Britain; the distinction that makes so much sense in America between these two forms of institutions does not apply with us.

Now, these institutions all have constitutions. Sometimes the constitution is very simple. Sometimes, as in the university to which I now belong, the University of London, it is incredibly complex. (I do not believe that anyone understands the constitution of the University of London. The late professor Harold Laski used to claim that he did. He is now dead. And I'm not sure that I ever believed him. I think that what he did was to over-awe people so that they believed that what he said was the constitution of the University must be the constitution of the University.) In other cases they are very simple. And if you look at these constitutions on paper, you will see that in most cases the university is responsible to some board of governors, or whatever else it may be called.

But I'm trying to discuss the facts, not the legal fictions, and when I say that our universities in Britain are syndicalist, I mean this. It's de facto true. I have heard complaints, particularly in some of the English provincial, unitary universities, the Red Brick universities, that there is terrible interference from local trustees, or whatever they may be called. But this, I must confess, when you investigate these cases, nearly always seems to be trivial and unimportant. So I stand by my statement.

And the faculties in these universities are, in a way, more secure, I think, than their opposite numbers in America. Normally, after serving a period of two to four years, usually three years, the teaching member of a faculty of a British university has tenure. For instance, I believe I am correct in saying that I can be dismissed for "gross and persistent immorality." (I've never been quite clear whether this means I can be immoral in a small way all the time, or am allowed one great, vicious burst.) I'm terribly aware that it is fairly difficult to remove me, and this is true of nearly all my colleagues. We have security. We have, I think, on the whole, a slightly higher social status in our society than is usual in America. (Some of my American sociological friends argue that over with me, and say that American professors go around under-estimating their status and feeling sorry for themselves when they don't need to. That is not a dispute which I as a stranger can settle.)

We have, I think, security; status; and poverty...plus long vacations. And most of us like this situation very much. We don't like the poverty, but we're willing to put up with the other things. And we run our universities--with the aid of full-time administrators, to be sure--but we run our universities very much on our own, on a committee system.

Now, this doesn't mean the faculty in British universities all love each other, and that it is a perpetual love feast. Quite the contrary. We often hate and despise and abominate each other. Any closed society produces this sort of reaction; but because at the heart of our universities is the idea that the university is a community of learned men and women, we do manage to get along with each other, and this committee system is a real system.

Now, this is not always completely true, because, of course, whoever pays ultimately has a considerable element of control. This may vary. In the Scottish universities, for example, the students who are fee-payers have access and, in theory, but not in fact, considerable power in making the policy of the university through their elected student representative councils. I don't think that happens in any American university and it doesn't happen so far as I know outside of Scotland, and there it is more fiction than fact. Again, there are these bodies of trustees or governors and so forth, but their function is largely honorific, and I, myself know of no really serious case, outside of the University of Wales, of their intervening in the conduct of any British university.

On the other hand, there is this mysterious body I mentioned, the UGC, the University Grants Commission. This was set up under the following circumstances. It was quite clear that in the modern world, universities caould not be run on their own resources, however rich they might be, or yet on the fees of their students, without excluding many people from the universities who ought to be in them. The universities would have to receive aid from central government. But the universities were equally determined that if they received aid from central government, they would not receive this aid from the Ministry of Education, which is ultimately responsible for the conduct of our education up to the university stage.

So a special body was established, the University Grants Commission, through the treasury, through the financial side of our government, where by a process of cooptation, tempered by democracy on the one hand and by chicane on the other, a group of people from the higher civil service and a group of people from the highest stratum of the universities would meet together to apportion funds directly from government, without going through any of the specific *ministries* of the government, to the universities.

Now, the UGC is a body of growing power, outside of the universities, but controlling their finance more and more. At first, the UGC on the whole was not very concerned to say how money was to be spent. But more and more its grants are officially called "earmarked" grants--funds which can only be expended by stealth on objects other than those laid down for them. But since, on the whole, it is the higher authority of the universities themselves that really has the deciding say on who goes onto the UGC, there is not too much complaint about this, though there may be some in the future.

I'm coming very near to the end of what I want to say about the British tradition, and I will actually come to my subject in a very few minutes. In British universities (and I think this is rather important, for they do vary very much and the gap between the best British and the worst British university is very great) salaries are paid very much on the same basis. There are difficulties about this. In London we receive slightly higher salaries than elsewhere; certain faculty jobs at Oxford pay very high salaries, others carry extraordinarily low salaries, but in general there is a national salary scale for all universities. All universities are formally equal, and this is very important in the working of the system I have described.

And all our universities have inherited something further. They have inherited an ideology which says that the universities exist for the education of an elite.

Now this is *not* because of the primeval age of our universities. It is quite true that Oxford and Cambridge are very old and some of their buildings, when they have not been refaced with artificial, synthetic stone, are very venerable. It is also true that the four Scottish universities are of considerable age. But most British universities are remarkably young, and this is not something that I think is wholely realized outside of Britain, or even within Britain. I am at the moment visiting professor at the University of California. The University of California is, by British standards, a rather venerable institution. But this is not the normal picture that is given of British life. It happens to be true. Most British universities are creations of the present century. They are new, young. Within the University of London (which after all did not come into existence until the 1820's) the body to which I have the honor to belong, the London School of Economics and Political Science, was founded as recently as 1895.

These new institutions have taken over from Oxford and Cambridge the idea of a certain kind of elite education. This is mirrored in our enrollment figures. Let me put it like this. Forget for a moment that America is a much richer country than England. Forget that for a moment, and look at the fact that both are advanced industrial countries, of, I think I may safely say, a high level of civilization. In Britain, within our universities at any given moment we have roughly 100,000 students. Now, that's a slight under-estimation as compared to the American figures, because there are a number of bodies which give training, at least to the university standard, which are not called universities. But still it is the official figure and we will stay with it. There are, at any given moment, at least three million students (and on some bases of calculation you can make it many more) of the American population at universities at any given moment. Now look at this in terms of comparative population. That means that there is roughly only one out of every 520 people in Britain at the university, at any given moment, while there is roughly one out of every 60 people in American universities.

We do, in fact, educate at the university level, a very small proportion of our total population. And I personally believe that we are wrong in doing this. I believe that British higher education, still retaining the framework I described to you, could be much more democratic (using the word in its popular sense) than it is; that it ought to be much more democratic than it is for moral reasons; and that it must be much more democratic than it is for simple reasons of national well-being. I shall come back to this point about the elite and the ideal education for an elite rather later on.

Impressions of American Higher Education

Now, let me turn for a moment to my impressions, very limited, very sketchy, terribly presumptious, of American higher education.

You know how the French dramatist Anouilh divides his play into two groups, the *piece rose*, which you can look at and enjoy in a relaxed sort of way, and *piece noir*, and how often for each black play concentrating on the negative side of things there is also a rosy play. I am going to concentrate now on the *piece noir*, or the black side of things a little. But do please remember that there is also the other side and that both are equally important. And I'm going to talk, as I say, very autobiographically; because any other sort of talk would be dishonest.

One of the things that has most struck me is a certain kind of status anxiety and panic. The administration in American universities (and this *is* part of their administration, though it may not seem to be at first sight) does, it seems to me, involve dangling people on hooks for much longer than is good for them. This may be an excellent treatment for fishing bait, but I am not sure it is good for professors. In fact, I don't think it is. The status anxiety, the worries about tenure, and the worries about status within the system seem to me unnecessary and avoidable; they are reflected, as I shall try and suggest, throughout the total system.

With this goes the feeling somehow that being in a university, however much one may have wanted to be on the teaching staff, is, to many people, second best--that the real, important, valuable world is outside. Now this impression may be all wrong. I hope it is, but I got it. I think the two things are interlinked--the status panic and the feelings that reality is somewhere else. I think this last is terribly important if I am right about it.

Now within this world, the second thing that strikes me is the degree of departmentalization, the degree to which each department is separate from each other department, in which the possibility of a general community of the total academic body is made much more difficult by each department being separate and self subsistent. Now, of course, this is a matter of more or less. I think in Britain we may sometimes, in certain bodies, undoubtedly go too far in the opposite direction. But I can't help feeling that this divorces the teaching faculty from their proper interest and concern with matters of general university policy at the financial, the administrative, and, indeed, the curricula level. When I say curricula I mean the policy about curriculum. This lack of community, this departmentalization, and this anxiety do, I think, result in the faculties having a certain lack of generalized power. In their own specific area, the departments may be terribly powerful, but they do not have generalized power in the university as a whole.

Now the other side of this is my extraordinary surprise at the enormous size of the independent administration of American universities. There is a stereotype very widely held in Europe about America. I don't know whether it is true or not, and I perhaps shouldn't confess this because you should never confess what you stereotypes are to the people about whom you hold them. It is that in the whole field of technology America is extraordinary, quite wonderful; but in the whole field of administration and bureaucracy, America is absolutely terrible--clumsy, rigid, overweighted, and rather inefficient.

Now this is a European stereotype. On the whole, with some happy exceptions, I think that stereotype is true. All that is said about American technology is correct, but unfortunately a great deal that is believed about American administration is also correct. Not all of it--thank God not all of it--but a great deal of it is true, to my eyes as an outsider. And I suspect that American universities with their very large bureaucracies do have an overlarge regard for forms, for precedents, for doing things in the formally correct, paperwork way.

In the attempt, and it is a very laudatory attempt, to let the educators get on with the business of education and research and the preservation of knowledge, I think that in fact there has been a tendency for things to be taken too much out of the faculties' hands, for things to be left too much in a vacuum, a vacuum which has been filled with bureaucratic punctilio and the endless process of subdivision and growth to which all administrative bodies are liable. (Just as in the Middle Ages, once the feudal system had accomplished its work of bringing some sort of peace and security, it then ran riot, and a mass of subinfeudations and ceremonies of a quite non-functional character grew out of it. I suspect something of the sort has happened.)

This seems to me bad. Any university in the modern world is a large-scale enterprise. As such it must have a bureaucracy. And this bureaucracy must have considerable power. This is an absolute and unavoidable necessity. But for a bureaucracy to be efficient in performing its functions, it must have a kind of personal knowledge of and contact with major purposes of the institution which I suspect is lacking very often in the large bureaucracies of American universities.

And with this goes a certain feeling that the teaching faculty of the universities are somehow unworldly. On the contrary, you may have noticed that the one thing that university faculties all over the world talk about when they are alone is not the good, the true, or the beautiful--it is money. It is, on the whole, a fairly worldly concern.

I don't believe that faculties are ever particularly unworldly and not to be trusted with worldly matters; in fact, perhpas they occasionally need an idealistic bureaucracy to look after them in such matters. I do feel that there is a certain lack of trust at a whole series of levels, and that also there is a conflict of jurisdictions, very often, between the teaching staff and the administration. Now to some degree that is unavoidable everywhere, but I think I have met a little more of it here than I have met anywhere else I have been. And such a conflict is, I think, always unforturate.

If it is to be solved formally, by going through the "right" administrative procedures, it will usually be solved badly. This can only be solved happily, I believe, if there is a genuine interchange between the administrators and the faculty. And this can only be obtained if the university is a community. I said to begin with that universities exist as a community of learned men and women, and that this is the heart of all universities--not their buildings, not their laboratories, not even their libraries, not their students, but a community of learned men and women. This community must today include top administration. And I suspect there is more and more a tendency for the two to be separate.

I think this conflict of jurisdictions and separations results in certain policy models that are rationalistic, and not rational. They have the appearance of careful rationality and accountability but are not always the consequency of a careful weighing of values and the cost of obtaining these values, which is what I understand by rationality.

And this results in one of the things I am quite sure I am right about, almost the only thing I am sure I am right about; in terms of their great resources (and most universities in America, by British standards, have great resources) funds are spent less fruitfully than they might be. I think this is one of the consequences of such policy. In a sense, whoever ought to be getting value out of the universities is not getting quite the value they could hope to get in terms of this very large expenditure.

(I have been reading an endless flood of documents about American universities. I do admire the amount of publicly available information there is about the universities here. I wish there was a tithe of such information obtainable in my own country. We tend to proceed very often in an atmosphere of grand secrecy and do our stupidities, pretending we have done nothing.)

There is another aspect. Remember this is the piece noir, the black side, the dark side of the moon, as I have seen it. American universities, and this is something with both its good and bad side, are in some ways much more responsible and much less frivolous than British universities. By responsibility I am talking about universities as a whole, and by responsibility I mean responsibility particularly of the public universities to elected bodies. In some ways I think this is excellent. But in other ways I cannot help thinking that it goes too far.

Elected bodies are often swayed by pressure groups and also by panic and unrealistic movements of opinion. True responsibility to them is bound, at the top level of administration, to produce an atmosphere of nervousness, and of timidity. And I don't believe that universities can flourish in nervousness and timidity. University faculties are to a large extent made up of people who are naturally timorous. Now one should not encourage their vices; one should, in fact, try to encourage them to be bold.

With this timidity goes a certain frivolousness of a different kind from British frivolousness. When British universities behave in a frivolous and silly fashion, and they fairly often do, they are frivolous collectively. (I am nearly dying to tell you an anecdote which has two disadvantages in telling it--one, it is libelous, though true; further, it is slightly indecent. So I won't.)

I can't help thinking that in American universities the partial divorce from power and responsibility, the partial disjunction between high administration and faculty, and the responsibility to outside elected bodies of the public universities, result in a certain personal frivolity quite frequently; a certain irrealism, a contempt for the realities of the world, which some amount of hard administrative experience would not permit.

You see, if the university is to be a society of learned men and women, among other things, these people can only function properly if they are mature men and women. And they can only be mature men and women if they have responsibilities of a very wide character. Now the responsibility of the university teacher is very grave. But it is also very easy to forget. In the ordinary business of teaching, one forgets that after all one's role may in some ways be more serious than the role of a physician, for example. On the whole, at the worst, a physician can only kill someone; a university teacher can, very often, mentally cripple someone for life. I think that may be a worse thing to do.

But one can easily forget this terrible burden of responsibility. I think one's total responsibility can be increased by being involved more in the administrative process. And I think certain kinds of personal frivolity occur in American faculties as a consequence of the lack of such responsibility.

But the other side of this is, I think, altogether to be praised. I do think American higher education has proved itself infinitely more sensitive to the obvious needs of society than education in my own country, partly because it is responsible to these outside elected bodies, partly also because the full-time professional administrator has so large a voice in its conduct. And he is aware that he exists ultimately at the public pleasure, for the public will.

Without any discussion of fashionable but boring subjects like the Cold War, one can nevertheless say that leaving these international concerns apart, in our industrialized societies today, if we are to maintain values of freedom and justice, we can only hope to do so by maintaining efficiency so far as is possible in every aspect of life--every aspect, not just economic, not just the military, not just the technical, not just the natural sciences--but every aspect of life. And that this can only be done by a wide dissemination of higher education. It seems to me that this is where the American universities have scored enormously.

I have been impressed by standards (sometimes I have been told that I should be shocked by them). On the whole, I have found the American students I have actually taught (and they are a very limited number, in sample) intelligent and more verbally responsive than the students I have taught in Oxford and London. I found them rather less skilled in literacy, but this is something they can overcome and do try quite hard to overcome. And these students are not drawn from an elite nor selected to produce an elite. They are more and more rapidly being drawn from the whole population of your society.

Not merely is the number of students increasing because the population is increasing; the number of students is also increasing relatively. And yet, as far as I can see, the job that has been done with them has been an extremely good job. Where we have failed is that our syndicalism has often produced a self-satisfaction, and we have felt a certain privilege, a certain privileged power, in being the educators and the administrators of the education of an elite. We must overcome this. I hope that in Britain we are beginning to overcome it. In my own country, in Scotland, I think it has been largely overcome. But in England, as distinct from Scotland, it has a very long way to go.

I would like to see frankly, a combination of what I regard as the best features and responsibilities of British university life with what I regard as the best features of American university life.

Well, these are very personal, very autobiographical remarks. I don't know if they add up to what was hoped from me, or feared from me, or expected from me, but I have no more to say.

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II. PROJECTING STUDENT ENROLLMENTS

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V. RESEARCH ON THE TEACHING PROCESS AND FACULTY CHARACTERISTICS

Teacher Characteristics

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Borg, Walter, " Personality and Interest Measures as Related to Criteria of Instructor Effectiveness," *Journal of Educational Research* 50: 701-709, May, 1957.

Bunnell, Kevin, editor, *Faculty Work Load*, American Council on Education, Washington, 1960.

Proceedings of a workshop held at Purdue University, November 9-10, 1959.

Excellent material. Note especially new proposals by Dr. Theodore Caplow.

Gustad, John W., " They March to a Different Drummer: Another Look at College Teachers," *Educational Record* 40: 204-211, July, 1959.

The author discusses why people become college teachers and why some of them leave teaching for other positions.

Hobson, Robert L., " Some Psychological Dimensions of Academic Administrators," in *Purdue University Studies in Higher Education*, no. 73, pp. 7-64, Purdue University, Division of Education, Lafayette, Indiana, 1950.

Karch, Jacqueline Quigley, " Characteristics of Women Teachers of Education in Institutions of Higher Learning in the United States of America," *Dissertation Abstracts* 17: 796-797, 1957.

Keller, Robert J., and Abernathy, Margaret G., *The 1950-51 Survey of Faculty Activities at the University of Minnesota*, Bureau of Institutional Research, University of Minnesota, Minneapolis, 1951.

Lanzetta, John T., and Knoell, Dorothy M., *Some Correlates of Instructor Job Satisfaction*, U.S. Air Force Personnel and Training Research Center, Lackland Air Force Base, Texas, Research Report, no. AFPTRC-TN-55-28, 1955, 49 pp.

Eighty-five item attitude questionnaire. Relationship between scores on six scales and other attitudinal, demographic performance characteristics of the instructor sample. Base differences in job satisfaction and correlates of these differences were also explored.

List, Murray D., " An Intensive Life History Study of Pre- and Post-Retirement Personality Factors of Retired College Professors," *Dissertation Abstracts* 17: 1138, 1957.

A crucial period in the life of a college professor occurs when he retires and must adjust his mode of life to the restrictions retirement may impose upon him. Purpose of the study is to investigate by intensive life-history case studies the relationship between pre- and post-retirement constellation of personality factors and the levels of adjustment in two contrasting groups of retired college professors (those who are still professionally active and who are inactive professionally.)

Stecklein, John E., and Eckert, Ruth E., *An Exploratory Study of Factors Influencing the Choice of College Teaching as a Career*, U.S. Office of Education, Cooperative Research Program, Washington, 1958, 46 pp.

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Struening, Elmer, and Spilka, Bernard, " A Study of Certain Social and Religious Attitudes of University Faculty Members," *Psychological Newsletter*, no. 43, 1952, pp. 1-18.

Stunkard, Clayton, and Stecklein, John E., *Characteristics of the 1950-51 Full-Time Academic Staff of the University of Minnesota*, Bureau of Institutional Research, University of Minnesota, 91 pp., mim.

Trabue, Marion R., " College Teachers at Work," *Review of Educational Research* 22: 233-237, June, 1952.

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Weber, C.A., " Some Characteristics of College Teachers," *Journal of Educational Research* 46: 685-692, May, 1953.

Questionnaire method used--attempting to identify characteristics of teachers. Inconclusive--but suggests questionnaires relating to teacher friendliness, democratic methodology.

Woodburne, L.S., " The Qualifications of Superior Faculty Members," *Journal of Higher Education* 23: 377-382, October, 1952.

Analysis of random sample of faculty members over 15 year period, compared to 32 superior--in terms of advancement, etc. Superior group--brilliant or high quality research worker, outstanding or successful teacher possessing imagination, insight, or originality, industry, and integrity.

Teaching Methods

Carpenter, Clarence R., and Greenhill, L.P., *An Investigation of Closed-Circuit Television for Teaching University Courses*, Instructional Television Research Project, no. 1, Pennsylvania State College, University Park, Pennsylvania, 1955, 102 pp.

Fitch, Mildred L.; Drucker, A.J.; and Norton, J.A., Jr., " Frequent Testing as a Motivating Factor in Large Lecture Classes," *Journal of Educational Psychology* 42: 1-20, January, 1951.

At Purdue, 295 students in government (198 experimental and 97 control). Experimental got weekly quizzes and monthly and control got monthly. Both encouraged to attend non-compulsory weekly discussion groups. Frequently quizzed groups attended more discussion sections and had significantly higher achievement in course. Used analysis of covariance controlling on grade previous semester in same course. Superior grade accounted for only in part by voluntary attendance at discussion groups. When controlling both on previous grade and discussion attendance, frequently quizzed students still showed significantly higher achievement.

Guetzkow, Harold; Kelly, E. Lowell; and McKeachie, W.J., " An Experimental Comparison of Recitation, Discussion, and Tutorial Methods in College Teaching," *Journal of Educational Psychology* 45: 193-207, April, 1954.

Detailed report of what appears to be a well-designed experiment. Psychology students having some lectures, texts, tests and movies, were taught by three methods in their two recitation classes one week. (1) Recitation drill, (2) group discussion, and (3) tutorial study.

Johnson, Granville B., " An Experimental Technique for the Prediction of Teacher Effectiveness," *Journal of Educational Research* 50: 679-689, May, 1957.

A evaluation instrument for the analysis of teacher effectiveness was developed. Attitudes relevant to teacher effectiveness were measured by means of a TAT type test and a group Rorschach. Age and teaching experience were also considered as variables. The TAT type test appeared to be a valuable tool for prediction. The Rorschach did not add significantly to prediction. Age itself was not significant, but some of its residual features were.

Maize, Ray C., *A Study of Two Methods of Teaching English Composition to Retarded College Freshmen*, Doctor's thesis, Purdue University, Lafayette, Indiana, 1952, 144 pp., typed.

One group taught in traditional manner with workbook drills and weekly theme; the other taught by lab method, using no text, calling for varied writing experiences. Latter proved superior in all measures except vocabulary.

Morsh, Joseph E., and Wilder, Eleanor W., *Identifying the Effective Instructor: A Review of the Quantitative Studies 1900-1952*, U.S. Air Force Personnel and Training Research Center, Research Bulletin, no. AFPTRC-TR-54-44, 1954, 151 pp.

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Ruja, Harry, "Experimenting With the Discussion in College Teaching: A Survey of Recent Research," *Educational Administration and Supervision* 39: 321-342, October, 1953.

Twenty-eight reference annotated bibliography. Summary: research has been zealous but somewhat diffuse, in some respects undisciplined. Procedure not uniform, cannot make comparisons or pool results. Criticizes "loose" control on some studies and lack of validation. Reviews questions unanswered by research.

EVALUATION OF FACULTY

Bendig, Albert W., "Comparison of Psychology Instructors and National Norms on the Purdue Rating Scale," *Journal of Educational Psychology* 44: 435-439, November, 1953.

Bendig, Albert W., "A Preliminary Study of the Effect of Academic Level, Sex, and Course Variables on Student Rating of Psychology Instructors," Journal of Psychology 34: 21-26, July, 1952.

Coffman, William E., "Determining Students' Concepts of Effective Teaching From Their Ratings of Instructors," Journal of Educational Psychology 45: 277-286, May, 1954.

Crannell, Clarke W., "A Preliminary Attempt to Identify the Factors in Student-Instructor Evaluation," Journal of Psychology 36: 417-422, October, 1953.

Fulkerson, Glen, "A Resume of Current Teacher Personnel Research," Journal of Educational Research 47: 669-681, May, 1954.

Guthrie, E.R., "The Evaluation of Teaching," Educational Record 30: 109-115, April, 1949.

Hamlin, Wilfrid G., "A College Faculty Looks at Itself," Journal of Higher Education 28: 202-206, April, 1957.

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Lancelot, William H., and others, The Measurement of Teaching Efficiency, Macmillan, New York, 1935, 237 pp.

Maslow, A.H., and Zimmerman, W.A., "College Teaching Ability, Scholarly Activity and Personality," Journal of Educational Psychology 47: 185-189, March, 1956.

Correlated colleague ratings "as a teacher" and "for creativeness" and each of these with student's ratings "as teacher" and "as personality." Authors admit their method open to criticism on several counts, and that student population of Brooklyn College unusually scholarly and serious.

Norem, G.M., and others, "An Evaluation Schedule for Academic Ranking," Peabody Journal of Education 28: 21-41, July, 1950.

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Sanders, J.B., "Brooklyn College Students Rate Their Teachers," Higher Education 5: 94-96, December 15, 1948.

Springer, E. Kent, "Criteria for Advancement and Promotion of the Teaching Staff," *Higher Education* 7: 117, January 15, 1951.

Description based on findings of a small survey of USC in 1948 faculty committee. Emphasized teaching ability over research.

Stauffer, John Nissley, "Judgment of Liberal Arts College Teachers and Deans Regarding College Teacher Qualifications," *Dissertation Abstracts* 17: 285-286, 1957.

The main purposes of the study were to determine the relative importance of qualifications of college teachers in the judgment of academic deans and their most promising young teachers, to find the extent of agreement between judgments by deans and teachers and between these judgments and those previously reported for presidents by Trabue; and to find what qualifications are representative of successful college teachers in the judgment of deans and teachers.

Stuit, Dewey B., and Ebel, R.L., "Instructor Rating at a Large State University," *College and University* 27: 247-254, January, 1952.

Grading Practices

Coward, Ann F., "A Comparison of Two Methods of Grading English Compositions," *Journal of Educational Research* 46: 81-93, October, 1952.

Dahnke, Harold L., and Mayhew, Lewis B., "Grading by Instructors and Examinations," *Junior College Journal* 26: 144-148, November, 1955.

For communication, humanities, natural science, and social science, student grade was determined by combining grade of instructor with grade in final examination prepared by Board of Examiners (50-50). Correlated two grades-found positive relationship, differing for different courses.

Keller, Robert J., and Vold, George B., "Grading Practices at the University of Minnesota," in *A University Looks at Its Program*, pp. 31-36, edited by Ruth E. Eckert, and Robert J. Keller, University of Minnesota Press, Minneapolis, 1954.

Used winter quarter 1948 grades (U. of M.) to study (1) implications of grading practices currently used, (2) effect of having both graduate and undergraduates in same class.

Thompson, Wayne N., "A Study of the Grading Practices of Thirty-one Instructors in Freshman English," *Journal of Educational Research* 49: 65-68, September, 1955.

Travers, Robert M.W. and Gronlund, Norman E., "The Meaning of Marks," Journal of Higher Education 21: 369-374, October, 1950.

Exploration of marking system in a graduate school (U. of Mich.) questioned 50 faculty members--meaning of marks--no agreement. Author questions marks as criterion for graduation.

Student Ratings of Instructors

Anikeeff, Alexis M., "Factors Affecting Student Evaluation of College Faculty Members," Journal of Applied Psychology 37: 458-460, December, 1953.

Clark, Kenneth E., and Keller, Robert J., "Student Ratings of College Teaching," in A University Looks at Its Program, pp. 197-212, edited by Ruth E. Eckert, and Robert J. Keller, University of Minnesota Press, Minneapolis, 1954.

Uses of student ratings as means to improve instruction--26 SLA faculty (volunteers) rated on scale developed from student suggestions and faculty committee (based on Meehl's work). Twenty-one items.

Downie, N.M., "Student Evaluation of Faculty," Journal of Higher Education 23: 495-496, December, 1952.

Describes method of student evaluation of teachers at State College of Washington, January, 1949. Cites differences found in ratings of faculty at different ranks, with different degrees, and at different ages.

French, Grace Marian, "College Students' Concept of Effective Teaching Determined by an Analysis of Teacher Ratings," Dissertation Abstracts 17: 1380-1381, 1957.

Holland, John B., "The Image of the Instructor As It Is Related to Class Size," Journal of Experimental Education 23: 171-177, December, 1954.

To study "the image of the instructor manifested by the student," 784 regularly enrolled students in a general education college course at Michigan State College in four different kinds of teaching sections and with four different instructors were used. Ranged from large lecture-discussion to small section of 25 students. Measured students perception of "image" of instructor on instrument of 10 5-point scales. Conclusions: are differences among instructors as to ways they are perceived by classes of different size, and that, other things being equal, there is a tendency for them to be more favorably received by small sections than by large sections of the same type.

Mueller, Francis J., "Trends in Student Ratings of Faculty," *American Association of University Professors Bulletin* 37: 319-324, summer, 1951.

Poll to find extent of use of student ratings in evaluations of faculty totaling 80.7 per cent of all colleges, universities, and teachers colleges in 1948-49 Educational Directory. Found 26 per cent colleges and universities uninterested in evaluation, 35 per cent interested, 39 per cent interested and experienced. Same percentages for teachers colleges--34 per cent, 36 per cent, and 30 per cent.

Van Keuren, Ernest, and Lease, Benjamin, "Student Evaluation of College Teaching," *Journal of Higher Education* 25: 147-150, March, 1954.

Tried successfully a different approach to student rating. Two instructors in same department collaborate. Students are asked to write essays--with objectives of the course in mind, what am I getting out of the course? How could conduct of course be improved?

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Eells, Walter Crosby, *College Teachers and College Teaching, An Annotated Bibliography on College and University Faculty Members and Instructional Methods*, Southern Regional Education Board, Atlanta, 1957, 282 pp.

Eells, Walter Crosby, *Supplement to College Teachers and College Teaching...*, Southern Regional Education Board, Atlanta, 1959, 134 pp.

VI. SPACE UTILIZATION STUDIES

(Based largely on Donald A. Jones' work cited below.)

Becker, Nathaniel, "Space Analysis in Architecture," Journal of the AIA 31: 40-43, April, 1959.

Brumbaugh, A.J., "How Can We Use Educational Facilities More Effectively," Educational Record 37: 102-105, April, 1956.

This is a discussion of some of the more important utilization findings in the author's experience and in the recent Arizona, California, and Mississippi studies. Nothing new is contributed but it is a good discussion of current status of utilization of classrooms in higher education.

California and Western Conference Cost and Statistical Study, to be published by the University of California.

Constance, Clifford L., "An Example of Space Inventory Codes and Record Card," College and University 35: 292-293, Spring, 1960.

A report of how the University of Oregon set up its inventory of physical space.

Constance, Clifford L., "Techniques of a Space-Utilization Survey," College and University 32: 29-33, Fall, 1956.

An excellent did-it-ourselves article by the Registrar of the University of Oregon, describing several thoughtful and frequently original statistical analyses of the utilization of classrooms, laboratories, and offices, beginning with simple listings of an "inventory of available academic space," and extending to the unusual analytical end of determining "what present classes should be scheduled differently, and where and when they should be relocated."

Cutler, Marjorie, "Workshop VI: Space Utilization and Classroom Assignment," College and University 26: 510-511, July, 1951.

A report of a workshop of the nation's registrars in which they decided that 40 per cent of full use of rooms and 25 per cent of seating capacity is normal. They felt that a comprehensive study would show that these figures are seldom exceeded. However, the materials in their bibliography show that these figures have been definitely exceeded.

Field, Herman H., "Graphic Method of University Space Analysis," *American School and University* 21: 75-80, 1949-50.

The report of an architect's effort to obtain more understandable reporting of utilization data through a series of transparent colored graphs which could be overlaid for cross-reference. Each room is shown with its class size, its theoretical optimum, units per room, its average attendance in the ten largest sessions, average attendance over hours of use, and average attendance when room is available. The graphs are good but somewhat cumbersome.

Hamon, Roy L., *Utilization of College Instruction Rooms*, The Author, Nashville, Tennessee, 1930, 98 pp.

Gawthrop, Paul R., *A Study of the Present Utilization of Physical Facilities, Together with a Projection of Enrollment for 1960, 1965, 1970*, Marietta College, Marietta, Ohio, 1956, 28 pp.

As described by the Russell-Doi *Manual*, "one of the most interesting and imaginative reports of space use and space needs" (p. 15). As there pointed out, this report is one of the few institutional reports demonstrating by example that "a good space-utilization analysis is not necessarily made only by a specialist, ...(but can be) done by a staff member (in this instance the acting head of the department of economics and business administration) with no previous professional experience in making space-utilization analyses for institutions of higher education."

It should also be noted that this report was prepared at the request of President W. Bay Irvine, not only for the trustees and faculty of Marietta College, but also "for use by other institutions"--indicating a willingness to disclose and share performance data on utilization in commendable contrast to the confidential nature, if not outright secrecy, which Russell and Doi found many institutions applying to their utilization data.

Hamon, Roy L., *Utilization of College Instruction Rooms*, The Author, Nashville, Tennessee, 1930, 98 pp.

This volume was the first published research study on utilization of instructional rooms in higher education. Although it is often quoted and many of its findings and conclusions are just as valid today as when the study was done, its principal interest today is historical. Its formulas and conclusions as to optimum utilization have no application today.

Hollis, Ernest V., *College Building Needs*, Office of Education, Special Series, no. 1, U.S. Government Printing Office, Washington, 1949, 58 pp.

This is a comprehensive survey of almost all institutions of higher education in the United States. Extremely useful, its figures were usually only approximations because actual figures were unavailable. It illustrates some uses of building and room inventory data on the national level.

Hollis, Ernest V., *State-Controlled Higher Education in Arizona*, Board of Regents of the University and State Colleges of Arizona, 1954, 288 pp.

The physical-facilities portion of this occupies only 14 pages, but they contain several observations and recommendations as well as a brief report on offices and on utilization of instructional rooms.

Holy, Thomas C., and Thompson, Ronald B., "Utilization of College and University Buildings," American School and University 20: 41-45, 1948-49.

This is a report on the utilization of instructional rooms and room capacity at Ohio State University, summarizing the development of the program of controls over space assignment and space utilization; with conclusions of definite value today.

Jones, Donald A., *Physical Facilities Analysis for Colleges and Universities*, American Association of Colleges for Teacher Education, Oneonta, New York, 1958, 211 pp.

This is an exhaustively detailed how-to-do-it manual on the establishment and maintenance of physical-plant records and scheduled-utilization tabulations by the use of punched-card forms and equipment. The book includes card and tabulating forms, together with definitions and instructions, for recording and compiling information on practically every physical and functional characteristic of whole buildings and individual rooms, and for tabulating the hour-by-hour and day-by-day utilization of classrooms and laboratories by organized classes.

Jones has made an even more monumental contribution to institutions with the manpower and equipment for the processing of punched cards than have Russell and Doi to the institutions with the less elaborate statistical facilities for which their manual was written. In both instances, however, there should be an accompanying how-much-to-do-first-if-at-all manual for the guidance of the uninitiated administrator who may not realize that each of these books describes more tabular reports than any ordinary staff can produce and evaluate before the data become obsolete.

Klein, Arthur J.. director, *Report of a Survey of the Need for Post-High School Education in the Lake Shore Area of Wisconsin*, American Council on Education, Washington, 1950, 179 pp., mim.

This report by capable men makes very definite recommendations toward additional physical plant for this area, but uses very little statistical basis for its conclusions. Comparison with later material shows very clearly the tremendous growth in the past few years in the use of materials gained from physical-facilities analysis.

Lombardi, John, and Trigg, Charles W., "Classroom Utilization on an Over-Crowded Campus," *Junior College Journal* 21: 337-340, February, 1951.

This report on classroom utilization at Los Angeles City College shows a considerably higher than average room utilization under rather adverse administrative conditions.

Masiko, Peter, Jr., "Toward 100 Per Cent Classroom Utilization," *Junior College Journal* 22: 12-14, September, 1951.

A novel method of scheduling, which combined with firm control gave almost 100 per cent utilization in a junior college.

Master Plan For Higher Education in California, Liaison Committee of the State Board of Education and the Regents of the University of California, 1959.

Method for Determining Space Needs Which Are Related to Enrollment, Analysis Division, Office of Architects and Engineers, University of California, Berkeley, November 22, 1957, 14 pp.

An unpublished administrative report.

Middlebrook, William T., *How to Estimate the Building Needs of a College or University*, University of Minnesota Press, Minneapolis, 1958, 169 pp.

This book is essentially a printed version of the University of Minnesota's first statistically detailed documentation of a biennial capital-outlay request to the State legislature in the context of a long-range building program. As such, it is a how-we-did-it-once book, rather than a general how-to-do-it manual. The techniques described are, however, no less generally applicable than those in the Jones and Russell-Doi manuals--which is to say that, once anyone has actually done one of these jobs, he'll start revising the techniques and standards, if only to solve more neatly the practical problems that he did not foresee the first time.

For its purpose--i.e., estimating long-range building-space requirements and then statistically describing those needs as an objective basis for capital-outlay budgeting--any presentation of the nature of the one in this book is a great improvement over the type of presentation usually made to governing boards, legislators, and prospective donors.

Morphet, Edgar L., The Measurement and Interpretation of School Building Utilization, Contributions to Education, no. 264, Teachers College, Columbia University, New York, 1927, 102 pp.

A comprehensive and intensive study of room and station utilization is presented for different types of rooms in 52 secondary schools. This set the pattern for much of the work in utilization which was to follow. The observations are still valid and in many cases still ignored. This work was the first to point out the comparative inadequacies of measuring a percentage of utilization as against an absolute utilization figure in terms of actual time.

Neil, James William, Instructional Space Requirements in Colleges, Universities, Doctor's thesis, Graduate Division, University of California, Berkeley, 1949, 120 pp., typed.

The California State Colleges and the four major campuses of the University of California are included in a mass utilization study which is one of the more important post-war contributions to facilities research. A partially successful attempt is made to derive from this study a formula for the capacity in students of a given plant.

Packer, Paul C., Housing of High School Programs, Contributions to Education, no. 159, Teachers College, Columbia University, New York, 1924, 51 pp.

In this research study, the instructional programs, building utilization, and building-program relationships for 59 overcrowded high schools of varying sizes were analyzed in the attempt to develop a technique for determining the number of instructional rooms required for the program of studies offered. Although this is the first attempt of its kind and is for secondary schools, it has been very influential, is often quoted, and still has some value since no completely comparable thing has as yet been done for colleges.

Petrie, Roy G., "A Plan for the Measurement of Room Use in Colleges and Universities," Stanford University Abstracts of Dissertations 25: 472-475, 1949-50.

In the only really different research study, an attempt is made to do a classroom and laboratory utilization study which would relate the utilization of a room to a number of points in the philosophy under which that room is being operated, as well as the physical characteristics of the room itself. From this it is concluded that utilization is relative. As the conditions which affect utilization change, so does the index of use.

Reeves, Floyd W.; Kelly, Frederick J.; and Russell, John Dale, *University Plant Facilities*, vol. 9 of the University of Chicago Survey, University of Chicago Press, 1933, 155 pp.

This volume from the large University of Chicago Survey is one of the earliest published attempts at an over-all study of physical facilities in higher education. It presents, as well as utilization figures, generalized data on the entire physical plant and its use. Its value today is principally historical.

A Restudy of the Needs of California in Higher Education, California State Department of Education, Sacramento, 1955, 473 pp.

This is the largest, most inclusive, and best done study published to date. Chapter V., 83 pages, is devoted to physical facilities. Little concerning techniques is given but the resulting reports are quite worthwhile.

Another excellent feature is the pioneering attempt to develop standards for space allocation.

Russell, John Dale, and Doi, James I., *Manual for Studies of Space Utilization in Colleges and Universities*, American Association of Collegiate Registrars and Admission Officers, Ohio University, Athens, Ohio, 1957, 129 pp.

This is the first how-to-do-it work to get in print. Its instructions are very generalized. A chapter on "The Status of Space Utilization Studies" is quite good. In most cases definitions of terms are in agreement with those in the Jones volume.

The final chapter, entitled "Normative Data," contains a considerable amount of excellent material, but care should be exercised in its use because in some cases diverse and non-comparable types of institutions such as junior colleges and large universities are combined in one table as if they composed a homogeneous group.

Smith, Donovan E., "Better Utilization--But Watch Out!" *College and University Business*, vol. 25, no. 2, August, 1958, p. 17.

A very short article that appeared as a guest editorial, warning against the dangers of over-dependence on conventional measurements of utilization, and of over-concentration on even the most comprehensive space studies and standards.

Smith, Donovan E., "College and University Space Requirements," *American School and University* 26: 287-296, 1954-55.

An article by one of the leaders in this field, with the space standards, first developed by Smith and then revised by him in the California Restudy of 1955 (see Holy, T.C., *et. al.*). Although, to a considerable extent, the standards are not validated, they are quite useful.

Smith, Donovan E., "How Can Institutions Increase the Effectiveness of the Use of Space, Equipment, and Other Facilities?" in *Current Issues in Higher Education, 1955, Proceedings of the Tenth Annual National Conference on Higher Education*, pp. 150-158, Association for Higher Education, National Education Association, Washington, 1955. (This paper appeared also as an article, "Effective Use of Space, Including Equipment and Other Facilities," *College and University Business* 19: 34-37, September, 1955.)

This is one of the better discussions of the need for figures and data on facilities. Written as an introduction to a panel discussion, however, it merely sharpens the question without providing any answers.

Smith, Donovan E., "Long-Range Space Planning," *Proceedings of the Sixteenth Annual Meeting*, Western Association of College and University Business Officers, 1954, pp. 59-63.

Essentially the same basic material as in Smith's article in *American School and University*, but with some interesting nomographic presentations of the space standards there presented in more prosaic but more usable tabular form.

Smith, Donovan E., "More Effective Use of Buildings and Facilities," *Facing the Critical Decade*, Proceedings of Western Regional Conference of President's Committee on Education Beyond the High School, Western Interstate Commission for Higher Education, 1957, pp. 75, 90-92.

Another paper prepared as part of a panel discussion short on how-to-do-it information, long on speculation.

Smith, Donovan E., "Physical Planning Standards," *Proceedings, First Quinquennial Assembly*, National Federation of College and University Business Officers Associations, 1955, pp. 82-95.

A largely extemporaneous discussion of space standards, emphasizing variations in per-student space requirements for different subject fields, levels, and methods of instruction, and for different kinds of institutions. The verbatim record of the ensuing question-and-answer session contains more information applicable to practical problems than does the "paper" itself.

Smith, Donovan E., *Report on Utilization of Instructional Rooms*, University of California, Berkeley, February 26, 1958, 33 pp.

An unpublished administrative report.

Strayer, George D., editor, *A Report of a Survey of the University System of Georgia*, Regents of the University System of Georgia, Atlanta, 1949, 343 pp.

As one of the series of postwar studies of statewide systems of higher education, this study does more with facilities than most. However, the difference between it and the California Restudy of 1954 is remarkable.

VII. CAMPUS PLANNING

Alexander, Robert E., "Re: Planning a Campus, Memo to R.J. Neutra," *College and University Business* 26: 33-38, January, 1959.

An interesting article generally summarizing factors that should be considered in preparing and executing a development plan for any educational institution.

Begrow, H.J., "Planning the University City," *Educational Business*, April, 1959.

Gallestel, A.F., *The Campus Plan*, University of Wisconsin, Madison, n.d., 8 pp., mim.

A brief discussion of the reorganization of the campus plan with comments on the architectural trends in universities as of 1951.

Haelsig, Harry C., *University Community Study*, A Report of the City Planning Department, City of San Diego, March, 1959.

A community planned to accommodate a proposed large general university campus.

Hudnut, Joseph, *Blueprint for a University*, Wayne University Press, Detroit, 1944, 13 pp.

The essay is a discerning analysis of the place or function of an urban university in a large metropolitan community. It develops the social and political and economical concept of the "city within a city".

Luce, Henry R., *Good Architecture is Good Government*, an address given by the Editor in Chief of Time, Inc., at the A.I.A. Centennial, Washington, May 16, 1957.

The paper is not strictly University or College oriented, however it makes a case for fine and enduring architecture which should certainly eminate from our institutions of higher learning.

It contains a plea for better balance in these days to overcome the often expressed attitude "more pay for teachers, more scholarships--but let's don't spend money on bricks and mortar".

Pereira, William L., *College Planning Today*, n.pub., n.p., May 5, 1954.

Reprinted from 41st Annual Meeting, News Letter of the National Association of Physical Plant Administrators of Universities and Colleges.

A thoughtful presentation and plea for creative thinking due the planning process and development of the total environment.

Stouffer, Ernest L., "Planning an Overall Longtime Campus Program," American School and University 17: 62-66, 1945.

Another witness to the fluidity of the so-called campus plan.

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Bokelman, W. Robert, *Higher Education Planning and Management Data*, 1958-59, Circular no. 549, Office of Education, U.S. Department of Health, Education and Welfare, 1959, 126 pp.

Brumbaugh, A.J., *Research Designed to Improve Institutions of Higher Learning*, American Council on Education, Washington, D.C., 1960, 47 pp.

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Eckert, Ruth E., and Keller, Robert J., editors, *A University Looks at Its Program*, University of Minnesota Press, Minneapolis, 1954, 223 pp.

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Godfrey, Rollin E., *The Role of the Registrar in Institutional Research*, The Woman's College of the University of North Carolina, Greensboro, 1959, 207 pp.

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Harvard University Faculty of Arts and Sciences, "Reports of the Committee on Improving Instruction in Harvard College," *Harvard Graduate's Magazine*, June, 1904.

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Lowell, A. Lawrence, "College Studies and the Professional School," *Educational Review*, October, 1911.

Lowell, A. Lawrence, "Scientific Study of Education," *At War with Academic Traditions in America*, Cambridge: Harvard University Press, 1934.

Purks, J. Harris, *The Subject of Academic Planning in Alligator Farm Management*, speech delivered at Third State of the University Conference of the University of North Carolina, March 10, 1955, n.pub., n.p., n.d., 5 pp., mim.

The Role of Foreign Languages in a Liberal Arts College, Bureau of Institutional Research, University of Minnesota, Minneapolis, 1954, 73 pp.

Sprague, Hall T., *Institutional Research in the West*, Western Interstate Commission for Higher Education, Boulder, Colorado, 1959, 78 pp.

Stecklein, John E.; Corcoran, Mary; and Ziebarth, E.W., *The Summer Session: Its Role in the University of Minnesota Program,* Report series no. 1, Bureau of Institutional Research, University of Minnesota, Minneapolis, 1958, 188 pp.

Stickler, W. Hugh, *Institutional Research Concerning Land-Grant Institutions and State Universities*, Office of Institutional Research and Service, Florida State University, Tallahassee, 1959, 142 pp.

Stiles, Ezra, The Literary Diary of Ezra Stiles, Franklin Bowditch Dexter, editor, New York: Charles Scribner's, 1901, vol. 2.

Veblen, Thorstein, The Higher Learning in America, New York: The Viking Press, 1935.

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APPENDIX A

Forms, Instructions, and Illustrative Tabulations for the Analysis of Class Size, Teaching Load, and Instructional Costs

ASSOCIATION OF STATE-SUPPORTED INSTITUTIONS OF HIGHER EDUCATION IN COLORADO

Analysis of Class Size, Teaching Loads, and Instructional Salary Cost per SCH for the Regular Academic Year 1958-59

Form 1. Report of College-level Classes Taught on Campus

Instructions for filling out the report

1. Purpose of the report. The data of this report are needed as a basis for analyzing institutional budget requests. The data will be used in three ways: (1) to compute faculty teaching loads; (2) to analyze size of classes; (3) to figure instructional salary costs per student credit hour. The blank has been arranged so that the data may be entered directly from the Registrar's records with, it is hoped, a minimum of effort. Typewriter may be used in filling out the report. Please use double space.

2. Classes to be included. Please include each class and class section taught during the first and second semesters (or the fall, winter, and spring terms) of the academic year. Do not include classes taught in summer session. (We shall probably ask for a separate report on summer session classes at a later date.) List only courses taught on the campus as a part of the institution's normal residence-study program, excluding courses taught elsewhere or by extension or correspondence. If a course taught on the campus is considered an "extension" course, it should be included if the instructor giving it has the course counted as a part of his regular teaching load; but such a course should be excluded if it is not considered a part of the instructor's regular teaching load and he is paid an extra amount beyond his regular salary for giving the course.

3. Order of listing classes. Please list first the classes taught in the fall semester or term, then the classes taught in the winter (second) semester or term, then (in case of institutions on the quarter system) the classes taught in the spring term. Within each semester or term classes should be grouped by departments, i.e. all English classes together, all mathematics classes together, etc., using the departmental organization and nomenclature customarily followed in the institution. Also, please group the classes in the following order: (I) Fall quarter or semester; (II) Winter quarter; (III) Spring quarter or semester. Start each departmental list on a new page. Within the department classes should be arranged in order of course number, the smallest number first.

4. Separate listing for each class. Each class and class section should be listed on a separate line. Thus if English 101 is taught in five parallel sections, each section should occupy a separate line in the report. In the column headed "section" the class sections of a course should be numbered or lettered (a, b, c, d, e, etc.) in accordance with the institution's usual pattern of designation. If the course is given in only one section, there need be no entry in the column headed "section."

5. Departmental assignment of courses. A course that is recognized in more than one department (such as "English 101, same as Speech 101") should

Form 1. Instructions for filling out the report.

have complete entry made under only one department, the one to which it is principally attached. In the other department or departments in which the course also has recognition it should be entered only by the course number by which it is identified in that department, with the notation under the column "Title of Course" showing the department and course number of its primary listing. Thus if English 101 and Speech 101 are the same course and it is considered as primarily belonging to the Department of Speech, the full entry of title of course, instructor, credit value, number of students, etc., should be made in the listing of the courses of the Department of Speech. But in the listing of courses of the Department of English this course would appear only as "English 101-Same as Speech 101," with no further data entered.

6. Indication of level of course. If the course numbering system positively and unequivocally identifies the level of students for which each course is intended, no entry need by made in the column headed "Course Level." Otherwise the level of the course should be identified in that column, using the appropriate symbol or combination of symbols from the following list:

L - Lower division (freshman and sophomore)

U - Upper division (junior and senior)

G - Graduate

7. Title of course. The title given for each course should be the same as that in the institution's catalog. Abbreviations may be used in the report, just so the identity of the course will not be mistaken.

8. Identification of instructor. Only the surname of the instructor of the course need be given, except that in case two or more faculty members have the same surname they should be identified by initials, such as H. Smith, J. Smith. It is important that the name of each instructor be reported in such a way that it can be identified on the salary list supplied by the institution in connection with its proposed operating budget.

9. Indication of semester or term. Indicate the semester or term by a Roman numeral, using I for the fall semester or term, II for the winter semester or term, and III for the spring term (if on the quarter system).

10. Hour and days of class. Indicate the hour of the day at which the class or class section is taught by an arabic number, and the days of the week by the customaryabbreviations (MTWTHFS). If several different courses are taught at the same time under a single instructor, as sometimes is arranged in laboratory subjects, these classes should be listed consecutively, out of numerical order if necessary, and bracketed to show that they should count as only one class in the instructor's teaching schedule.

11. Contact hours per week. In the column for contact hours per week, show the number of hours per week that an instructor meets with his class.

Form I. Instructions for filling out the report.

This information can be readily obtained by examining the number of hours and days of class meetings. The following are examples:

English 201	9:00	MWF	3 contact hours per week
Chem Lab 101	2 - 5	W	3 contact hours per week

In the case of seminars and graduate thesis courses that are on an "arranged" basis, estimate the average number of hours per week that an instructor meets with a particular seminar group or the graduate student.

12. Credit value. The credit value of the course should be reported in terms of semester hours or quarter hours, in accordance with the practice of the institution. If a course is listed for an indefinite credit value (such as "Credit to be arranged") or for a range of values (such as "1-5 credits") enter as the credit value the whole number nearest to the average amount of credit granted per student taking the course for credit. Thus if an instructor's report for English 601 lists two students for one credit each, one student for 3 credits, one for 4 credits, and two for 5 credits each, the average would be 3.17 and the credit value for the course should be entered as 3.

13. Number of students. In the next to the last column of the blank enter the number of students carried on the official class list for the course or course section. (Please do not use the final column with the heading blank.) The roster may include students who did not take the course for credit, or who failed, or who withdrew after the time that such withdrawal had to be a matter of record. Normally students who withdraw from a course during the first week or two of the term are not considered as having been members of the class. The intention is to have the report reflect the number of students for whom the work in each class was a recognized and substantial part of their term's activities.

14. Supply of forms. The supply of forms furnished is intended to be sufficient to permit the institution to keep a carbon copy of its report for its files. We are sending only two copies of the "page one" sheet, the remainder of the supply being continuation sheets for the subsequent pages of the report. Additional blanks may be obtained on request, or the institution may prepare its own additional forms as needed, using the headings as indicated on the official blank.

15. Applied Music, Independent Study, Thesis, etc. It is recognized that in applied music, in independent study, thesis, classes by consultation and in some other forms of instruction the student receives private teaching from the faculty member. Usually the amount of credit given is greater than for spending an equivalent amount of time in classes taught by the instructor. Please use the following methods in reporting on such teaching:

Applied music or other private lessons - group all of the students in a particular course at a particular level as though they were a class. For

Form 1. Instructions for filling out the report.

example, if a teacher has 5 freshmen taking Violin 162, 3 sophomores taking Violin 262, 2 seniors taking Violin 462, and one graduate student taking Violin 662, this would be shown as four classes: Violin 162 - 5; Violin 262 - 3; Violin 462 - 2; and Violin 662 - 1.

Independent study or work by consultation -- group all students studying under the same course registration with the same man as a single class.

Thesis -- group all students studying under the same course registration with the same man as a single class.

(In analyzing the number of small classes, independent study and thesis enrollments will not be included. The applied music enrollments will be included but it is recognized that the number of small classes is necessarily high in this field of study.)

ASSOCIATION OF STATE-SUPPORTED INSTITUTIONS OF HIGHER EDUCATION IN COLORADO

Form 1. Report of College-level Classes Taught on Campus during 1958-59, Regular Academic Year

Name of Institution____

Date of this report____________________Name and title of person making this report____________________

To be returned to James I. Doi, University of Colorado, Boulder, Colorado

See special instructions for filling out this report

Department	Course Number	Section	Course Level	Title of Course	Instructor	Semester or Term	Hour	Days of week	Contact hours per week	Credit Value	No. of Students	Student Credit Hours

ASSOCIATION OF STATE-SUPPORTED INSTITUTIONS OF HIGHER EDUCATION IN COLORADO

Analysis of Class Size, Teaching Loads, and Instructional Salary Cost per SCH, for the Academic Year

Instructions for Filling Out Report Form 2

Column 1. List the name of every member of the instructional staff, including graduate assistants, part-time instructors, lecturers, etc., who was responsible for the teaching of any class or laboratory section at your institutions during the academic year. Please show initials after surname, as follows: Smith, J.C., and Smith, M.O.

Column 2. After the name of each member of the instructional staff, indicate his rank or title, such as professor (Prof.), associate professor (Assoc. Prof.), assistant professor (Assist. Prof.), instructor (Instr.), assistant (Assist.) or lecturer (Lect.). The terms enclosed by parentheses suggest acceptable abbreviations of titles.

Column 3. Group faculty members by departments. If a faculty member teaches in two or more different departments, list him in the department with which he is principally identified.

Column 4. If on a full-time service with the institution for the entire academic year, indicate by 1.00. If less than full-time service for the academic year, use appropriate decimal fraction, e.g., 0.75 or 0.33.

In studies of this kind, institutions tend to differ in their methods of determining the fraction of full-time to be assigned to the services of part-time lecturers and graduate assistants. One of three methods is generally used -- (a) estimate the full-time salary that an individual of comparable training and experience is normally paid in the institution, and divided this figure into the actual salary paid for the part-time service, the resulting quotient expressing the full-time quivalency; (b) estimate the total credit hours of classes normally taught by a full-time faculty member in the department, and divide this figure into the actual credit hours of classes taught by the part-time staff member, the resulting quotient expressing the full-time-equivalency; and (c) a "considered estimate", usually made by the dean or the departmental chairman, which may or may not take into account systematically such data as salary and duties performed. For the purpose of obtaining as high a degree of uniformity as possible in our inter-institutional studies, it is suggested that we use the first of the aforementioned three methods for computing the full-time-equivalency of part-time staff members.

Column 5. Indicate proportion of full-time to college instruction by use of symbols similar to those suggested for Column 4. Following are three principles to be used in assigning proportion of full-time to college instruction

a. A "full-time-equivalent" (1.00) faculty member means one person who devotes his full time to the instructional program of the institution, including such incidental research as is normally associated with a full-time teaching schedule. Time spent on separately organized and separately budgeted research is excluded. Thus a professor who spent three-fourths of his time teaching and one-fourth of his time in research at the Agricultural Experiment Station during the academic year, would be shown in Column 4 as a 1.00 staff member, but in Column 5 as a 0.75 full-time-equivalent faculty member.

b. Service as head of a department is counted as instruction, but service as dean or other central administrative officer is excluded. Thus a professor who spends two-thirds of his time as Dean of the College of Arts and Sciences and only one-third of his time in teaching classes should be reported in Column 5 as a 0.33 full-time-equivalent faculty member.

c. Wherever possible, use budget (salary) data to determine fraction of full-time devoted to instruction in the case of staff members who have two or more separately budgeted functions. For example, if the business office shows Professor Smith's total salary as prorated one-half to instruction and one-half to intercollegiate athletics, he should be reported in Column 5 as a 0.50 full-time-equivalent faculty member, regardless of his actual teaching load. It is assumed, of course, that the budgetary proration of a professor's salary is reasonably representative of the actual time that he devotes to each of several budgeted functions. If the business office does not, as a matter of regular procedure, prorate a professor's salary among several functions, then it will be necessary for the institution to estimate the fraction of full-time he devoted to teaching duties during the Academic Year. The usual procedure would be to estimate or compute the credit hours of classes taught normally by a full-time faculty member, and divide this figure into the actual credit hours taught by a person who devoted only part of his time to instruction.

Column 6. In Column 6, show the amount of salary for the regular academic year for each individual listed. The salaries of faculty members on 11-12 month appointments should be adjusted to 9-months (regular academic year) equivalents. Please append to your report a statement describing the procedure or formula used for making this adjustment.

Column 7. In Column 7, show the amount of the regular academic-year salary chargeable to instruction for the academic year. Institutions on a quarter-system should report one-third of the regular academic-year salary for faculty members who devote full time to instruction. If a faculty member spent only one-half of his time on instruction during the Fall quarter and the other one-half for some other function, the entry in Column 7 should represent one-sixth of his regular academic-year salary.

Institutions on the semester-system should show in Column 7 one-half of the regular academic-year salary for faculty members who devoted full-time to instruction. If a faculty member devoted only one-half of the Fall semester to instruction and one-half to other functions, the entry in Column 7 would represent one-fourth of his regular academic-year salary.

ASSOCIATION OF STATE-SUPPORTED INSTITUTIONS OF HIGHER EDUCATION
IN COLORADO

Form 2. List of Faculty Members and Their Salaries for 1957-58

(Please double space; report salaries only to nearest whole dollar.)

(1)	(2)	(3)	(4)			(5)	(6)	(7)
Name	Rank or Title	Department	Proportion of full-time spent on instruction			Academic Year FTE	Academic yr. salary (or in case of part-time staff, total pd during Acad. yr.	Salary chargeable to
			Fall	Winter	Spring			
Examples for Institutions on the Semester Systerm. (Use only Fall and Spring and omit middle column).								
Jones, P.T. Note: Jones is a full time staff member who devotes one-half of his time to instruction and the other half of his time to inter-collegiate athletics. One-half of his academic year salary should be charged to Instruction.	Prof.	Phys. Ed.	0.50	-	0.50	0.50	$8,000	$4,000
White, G.E. Note: White was on full-time instructional duty during the Fall semester and took a leave of absence without pay for the Spring semester. He was paid $2500 for his Fall semester services.	Asst. Prof.	English	1.00	-	-	0.50	2,500	2,500
Johnson, A.B. Note: Johnson was given a part-time appointment during the Fall semester fot which we was paid $750. If at this institution a full-time person of Johnson's qualifications would have been paid $3000 for the academic year, the full-time-equivalency for Johnson is 0.50 for the Fall semester. Assuming that Johnson gave all of his time to teaching, the total amount paid him should be charged to Instruction.	Assist.	Education	.50		-	0.25	750	750
Smith, O. W. Note: Smith taught full-time both semesters.	Assoc. Prof.	English	1,00		1.00	1.00	7,500	7,500

ASSOCIATION OF STATE-SUPPORTED INSTITUTIONS OF HIGHER EDUCATION IN COLORADO

Form 2. List of Faculty Members and Their Salaries for 1957-58

(Please double space; report salaries only to nearest whole dollar.)

(1)	(2)	(3)	(4)			(5)	(6)	(7)
Name	Rank or Title	Department	Proportion of full-time spent on instruction			Academic Year FTE	Academic yr salary (or in case of part-time staff, total pd. during acad. yr.	Salary chargeable to instruction
			Fall	Winter	Spring			
(Examples for Institutions on the Quarter System)								
Smith, J. C.	Asst. Prof.	English	1.00	1.00	1.00	1.00	$6,000	$6,000
Note: Smith is a full-time staff member devoting full-time all three quarters to instructional duties. The total amount of his regular academic salary should be charged to Instruction.								
White, N. E.	Assoc. Prof.	Economics	1.00	-	1.00	0.667	4,000	4,000
Note: White, who is ordinarily a full-time staff member for the entire academic year, took a leave of absence without pay during the winter quarter. He received $4,000 for his services for the entire academic year, or two-thirds of what he would have received had he not taken a leave. Assuming that White devoted his entire time to instructional duties during the fall and spring terms, the total amount he received should be charged to Instruction.								
Anderson, P. H.	Prof.	Phys. Ed.	.50	.50	.50	.50	8,000	4,000
Note: Anderson is a full-time staff member, but he devotes one-half of his time to instruction and the remaining one-half to inter-collegiate athletics. Thus, one-half of his academic year salary of $8,000 should be charged to Instruction.								
Brown, T. T.	Asst. Prof.	Psychology	.50	-	-	.167	2,000	1,000
Note: Brown left the institution after serving for one quarter. While he was on the staff he devoted one-half of his time to instruction and the other half to administering the testing and counseling service. One-half of the salary he received during the term he was employed should be charged to Instruction.								

Manual Analysis: Worksheet Form A

Semester: Fall 1958
Subject-field: Math

Lower Division Undergraduate

Class Size																	Total
1-4	Cr																0
	Sch																0
5-9	Cr																0
	Sch																0
10-19	Cr	3	3	3	3												12
	Sch	33	48	45	45												171
20-39	Cr	3	3	3	3												12
	Sch	60	75	90	99												324
40 or more	Cr	3	3														6
	Sch	150	126														276

Totals Cr 30
Sch 771

Upper Division Undergraduate

1-4	Cr																
	Sch																
5-9	Cr	3	3	3													9
	Sch	15	18	18													51
10-19	Cr	3	3	3	3												12
	Sch	33	45	45	48												171
20-39	Cr	3	3														6
	Sch	75	90														165
40 or more	Cr																
	Sch																

Totals Cr 27
Sch 387

Graduate

1-4	Cr	3	3	3													9
	Sch	9	12	9													30
5-9	Cr	5	3														8
	Sch	25	24														49
10-19	Cr																
	Sch																
20 or more	Cr																
	Sch																

Cr 17

Manual Analysis: Worksheet Form B

(Suggested form for manual analysis of class size, teaching loads, etc.)

Type of Analysis: Semester hours of classes taught

Subject Field	Fall Semester			Spring Semester			Academic Year			
	Lower	Upper	Grad.	Lower	Upper	Grad.	Lower	Upper	Grad.	Total
Anthropology	30	30	9	27	30	9	57	60	18	135
Biology	45	60	15	45	54	12	90	114	27	231
etc.										

(This form, or one similar to it, is useful for summarizing from Worksheet Form A data on credit hours of classes taught, student credit hours taught, percentage and number of credit hours taught in classes of a given size.)

Manual Analysis: Worksheet Form C.

Name of Faculty Member: Smith, S.S.

Subjects Taught:
a. French
b. Spanish
c. -

Subject Field	Course No.	Credit Hours of Classes Taught			
		Lower	Upper	Graduate	Total
Fall Semester:					
Spanish	101	3			3
Spanish	103	3			3
French	301		3		3
French	303		3		3
Totals		6	6	—	12
F.T.E. Proration		0.50	0.50	—	1.00
Spring Semester:					
French	302		3		3
French	304		3		3
French	506			3	3
French	510	—	—	3	3
Totals		0	6	6	12
F.T.E. Proration		0	0.50	0.50	1.00
Academic Year					
Summary:					
a. Credit Hours taught:					
French		—	12	6	18
Spanish		6	—	—	6
Totals		6	12	6	24
b. F.T.E. Proration:					
French		—	0.50	0.25	0.75
Spanish		0.25	—	—	0.25
c. Salary Proration:					
French		—	3,000	1,500	$ 4,500
Spanish		1,500	—	—	$ 1,500

Note: Data on F.T.E. Faculty form 2.
Data on Classes Taught form 1.

Manual Analysis: Worksheet Form D

Subject Field: French

Name of Instructor	F.T.E. Proration												Salary Proration			
	(A) Fall Semester				(B) Spring Semester				(C) Academic Year				(D) Academic Year			
	Lower	Upper	Grad.	Total	Lower	Upper	Grad.	Total	Lower	Upper	Grad.	Total	Lower	Upper	Grad.	Total
Jackson, T.R.	0.50	0.50	-	1.00	0.50	0.50	-	1.00	0.50	0.50	-	1.00	2,100	2,100	-	4,200
Jones, E.K.	0.50	0.25	0.25	1.00	0.50	0.25	0.25	1.00	0.50	0.25	0.25	1.00	4,200	2,100	2,100	8,400
Miller, F.S.	0.67	0.33	-	1.00	0.67	0.33	-	1.00	0.67	0.33	-	1.00	4,000	2,000	-	6,000
DeLattre, P.	1.00	-	-	1.00	1.00	-	-	1.00	1.00	-	-	1.00	5,500	-	-	5,500
Smith, S.S.*	-	0.50	-	0.50	-	0.50	0.50	1.00	-	0.50	0.25	0.75	-	3,000	1,500	4,500
Totals	2.67	1.58	0.25	4.50	2.67	1.58	0.75	5.00	2.67	1.58	0.50	4.75	15,800	9,200	3,600	28,600
I. Student Credit Hours	735	303	15	1053	675	275	33	983	1410	578	48	2036	-	-	-	-
(These data obtained from Worksheet Form A.)																
II. SCH per Faculty Member =	275.3	191.8	60.0	234.0	252.8	174.1	44.0	196.6	528.1	365.8	96.0	428.6	-	-	-	-
III. Salary Cost per SCH	-	-	-	-	-	-	-	-	-	-	-	-	$11.21	$15.92	$75.00	$14.05
													(Column D / Column C = Salary Cost per SCH)			

Note: Data on full-time-equivalency and salary proration obtained from Worksheet Form C.
Data on student-credit-hours obtained from Worksheet Form A, or from appropriate summary prepared on Worksheet Form B.

*See Spanish

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BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs
(January, 1959) File No. 21-211

Table 201. Scope of Subject-matter Taught, All Levels Combined, Expressed in Terms of Number of Semester Hours of Different Courses, at Each Institution During Regular Academic year 1957-58.

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		272			33		
Anthropology	92			5		3	
Art	116	35	44	62	56		
Biology	124	109	49	42	33	4	22
Business Admin.	155	94	104	90	187	3	25
Chemistry	103	69	67	32	59	46	36
Economics	50	27		15			6
Education	250	101	62	121	71		
Engineering:							
Architectural	50						
Chemical	51	26					
Civil	102	79					
Electrical	95	73					
General	15**				28	9	
Mechanical	100	106					
Met., Min., Pet.						80	
English	141	48	47	50	87	18	21
French	39	12	16	6	12		14
Gen. Education			1*	1	24		
Geography	29	12	6	12	32		6
Geology	101	4		8	29	42	8
German	22	18	16	6	12	9	14
Government	63	27	22	15	40	3	6
Greek	3				15		
History	130	57	33	24	67		18
Home Economics	55	90	38	40	63		
Industrial Arts	34		76	97	68		
Journalism	33	9	19	10	26		
Latin	18						
Law	94						
Mathematics	111	82	24	25	71	40	47
Military Science	57	40					
Music	94	62	66	72.5	115		
Nursing	29.5						
Pharmacy	66						
Philosophy	55		18		10		
Physical Education	114	52	88	70	80	8.5	
Physical Science				6			
Physics	103	91	20	8	31	82(a)	26
Portuguese	11						
Psychology	89	49	66	30	50		6
Religion					52		
Russian	20	12					
Social Science	6	4	10			6	
Sociology	63	27	19	9	25		
Spanish	90	49	36	24	32	6	14
Speech & Dramatics	104	14	33	26	66	3	
TOTALS: 1957-58	3077.5	1750	980	906½	1474	362½	269
(1956-57)	(2976)	(1727)	(1148)	(823½)	(1335)	(341)	(242)
(1955-56)	(3082)	(1699)	(1104)	(839)	(1351)	(353)	(348)
(1954-55)	(3030)	(1624)	(1016)	(757)	(1183)	(327)	(438)
(1953-54)	(2954)	(1616)	(1116)	(831)	(1219)	(316)	(443)
(1952-53)	(2979)	(1562)	(1130)	(833)	(1135)	(327)	(441)

*Equivalent of less than one semester hour. ** Nuclear Engineering. (a) Includes Graduate Geophysics.

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs
(January, 1959) File No. 21-212

Table 203. Total Student-credit-hours Produced (semester hours), Undergraduate and Graduate Combined, in Each Subject-field at Each Institution During Regular Academic Year 1957-58 (A 3-semester-hour class enrolling 20 students produces 60 student-credit hrs.)

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		3908			555		
Anthropology	3466			106		60	
Art	3768	761	679	590	1087		
Biology	6165	2993	1389	864	533	23	376
Business Admin.	7041	1554	2163	2162	5031	15	431
Chemistry	7281	4908	1092	368	895	1304	638
Economics	2348	1512		561			108
Education	7796	1818	2458	2040	3235		
Engineering:							
Architectural	3533						
Chemical	799	601					
Civil	3704	3181					
Electrical	4535	3891					
General	510**				439	374	
Mechanical	4118	6041					
Met., Min., Pet.						569	
English	15474	5664	2098	2012	4515	867	951
French	1482	96	64	45	128		88
Gen. Education			167	124	3721		
Geography	835	423	196	165	436		96
Geology	4965	132		192	404	737	148
German	1038	207	112	84	190	72	54
Government	2362	603	338	345	373	66	123
Greek	9				90		
History	7126	2292	600	543	1664		903
Home Economics	1515	1157	338	274	501		
Industrial Arts	416		905	882.5	902		
Journalism	378	24	158	47	200		
Latin	177						
Law	2162.5						
Mathematics	15936	7479	882	328	1960	1623	942
Military Science	1587	2550					
Music	2408	1184	1183	500.5	2291		
Nursing	396						
Pharmacy	831						
Philosophy	1906		630		71		
Physical Education	3784	996	1456	1631	2070	186	
Physical Science				66			
Physics	4623	3272	636	84	519	1294*	378
Portuguese	150						
Psychology	5801	2434	1265	1701	1439		198
Religion					931		
Russian	362	108					
Social Science	2367	60	1232			453	
Sociology	2019	717	255	252	543		
Spanish	3706	399	290	294	273	33	225
Speech & Dramatics	2923	729	923	321	1463	30	
TOTALS: 1957-58	141802.5	61,694	21,509	16,582	36,459	7706	5659
(1956-57)	(129,963)	(58,345)	(20,279)	(15,001)	(34,316)	(7333)	(4231
(1955-56)	(116,319)	(55,581)	(20,154)	(14,790)	(33,241)	(6728)	(4178)
(1954-55)	(108,147)	(48,876)	(18,036)	(11,189)	(28,983)	(5279)	(6366)
(1953-54)	(94,690)	(42,725)	(14,166)	(10,742)	(22,330)	(4927)	(7817)
(1952-53)	(91,769.5)	(39,262)	(13,116)	(10,362)	(19,557)	(4242)	(7598)

*Includes Graduate Geophysics **Nuclear Engineering

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs
(January, 1959) File No. 21-2121

Table 203a. Total Lower-division Undergraduate Student-credit-hours Produced (semester hours) in Each Subject-field at Each Institution During Regular Academic Year 1957-58

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mex. Military Institute
Agriculture		1454			442		
Anthropology	2301			106		-	
Art	2786	691	497	240	1025		
Biology	4738	2246	952	732	306	23	376
Business Admin.	3578	1001	1360	1304	3212	-	431
Chemistry	5815	4068	816	284	669	1051	638
Economics	1449	1308		396			108
Education	1586	100	811	-	846		
Engineering:							
Architectural	3315						
Chemical	159	285					
Civil	1050	879					
Electrical	1257	548					
General	-*				427	296	
Mechanical	789	3238					
Met., Min., Pet.						-	
English	13554	5374	1801	1722	3446	471	951
French	1294	96	64	45	128		88
Gen. Education			167	124	3670		
Geography	519	354	-	123	183		96
Geology	2972	132		192	267	342	148
German	999	189	93	84	190	72	54
Government	1248	501	124	213	147	-	123
Greek	-				-		
History	4869	1569	112	456	849		903
Home Economics	851	810	223	170	265		
Industrial Arts	290		801	842.5	589		
Journalism	141	15	50	32	141		
Latin	150						
Law	-						
Mathematics	13041	5301	842	295	1682	1394	942
Military Science	1004	1992					
Music	1695	1057	965	452.5	1653		
Nursing	207						
Pharmacy	377						
Philosophy	1578		500		20		
Physical Education	2966	832	889	973	1452	127	
Physical Science				-			
Physics	3168	2627	527	84	442	640	378
Portuguese	87						
Psychology	4020	1396	476	495	810		198
Religion					634		
Russian	362	108					
Social Science	2367	-	1208			453	
Sociology	939	465	83	153	234		
Spanish	2796	259	165	234	208	33	225
Speech & Dramatics	2608	675	828	219	1280	-	
TOTALS: 1957-58	92,925	39,570	14,354	9971	25,217	4902	5659
(1956-57)	(87,968)	(37,985)	(13,602)	(9361.5)	(24,019)	(4716)	(4231)
(1955-56)	(78,259)	(38,550)	(13,730)	(9429)	(23,410)	(4498)	(3541)
(1954-55)	(71,688)	(33,725)	(12,717)	(6944)	(21,663)	(3400)	(4789)
(1953-54)	(61,200)	(29,545)	(9,227)	(6786)	(17,077)	(3079)	(6290)
(1952-53)	(56,476)	(26,810)	(7,985)	(6324)	(13,895)	(2425)	(6322)

*Nuclear Engineering

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
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(January, 1959)
File No. 21-2131

Table 204-a. Weighted Average Size of Lower-division Undergraduate Classes Taught in Each Subject-field at Each Institution During Regular Academic Year 1957-58

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer..	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		20.2			17.7		
Anthropology	69.7			21.2		-	
Art	23.4	17.3	19.1	13.3	22.3		
Biology	40.5	21.6	32.5	18.3	20.4	5.8	15.7
Business Admin.	37.7	22.2	23.7	18.1	21.9	-	13.9
Chemistry	54.9	36.0	23.1	17.8	35.2	26.9	12.3
Economics	35.3	31.1		33.0			18.0
Education	28.3	50.0	32.9	-	49.8		
Engineering:							
Architectural	41.4						
Chemical	17.7	20.4					
Civil	25.9	25.9					
Electrical	26.7	34.3					
General	-*				13.3	17.4	
Mechanical	21.3	28.2					
Met., Min., Pet.						-	
English	27.1	24.2	19.6	23.9	26.1	19.6	16.7
French	22.7	8.0	4.0	7.5	10.7		6.3
Gen. Education			35.7	41.3	61.2		
Geography	57.7	29.5	-	41.0	20.3		16.0
Geology	41.9	16.5		24.0	22.3	26.3	16.4
German	32.2	15.8	8.8	14.0	15.8	8.0	3.9
Government	59.4	27.8	20.7	35.5	24.5	-	13.7
Greek	-				-		
History	66.7	32.7	28.0	25.3	32.7		20.1
Home Economics	19.8	17.6	10.2	10.0	10.2		
Industrial Arts	16.1		10.9	7.3	12.8		
Journalism	15.7	5.0	8.3	8.0	8.3		
Latin	12.5						
Law	-						
Mathematics	34.1	27.8	20.4	15.5	27.6	24.0	12.1
Military Science	23.9	24.9					
Music	17.7	13.6	20.7	15.3	12.9		
Nursing	12.2						
Pharmacy	16.4						
Philosophy	47.8		27.8		10.0		
Physical Education	25.8	20.8	17.8	24.9	27.4	18.1	
Physical Science				-			
Physics	45.3	25.3	18.4	10.5	24.6	22.9	12.6
Portuguese	14.5						
Psychology	52.9	48.1	29.8	27.5	54.0		16.5
Religion					17.1		
Russian	15.7	9.0					
Social Science	49.3	-	37.8			37.8	
Sociology	34.8	31.0	15.5	51.0	39.0		
Spanish	22.9	8.4	7.8	13.0	13.0	5.5	16.1
Speech & Dramatics	20.1	16.5	21.2	11.0	21.3	-	
TOTALS: 1957-58	32.8	24.7	20.3	17.3	23.9	22.6	14.1
(1956-57)	(31.4)	(22.7)	(18.0)	(17.4)	(25.4)	(25.2)	(11.7)
(1955-56)	(30.3)	(23.8)	(19.1)	(18.1)	(25.9)	(22.9)	(8.9)
(1954-55)	(29.4)	(23.7)	(18.3)	(14.9)	(28.1)	(21.0)	(10.6)
(1953-54)	(26.7)	(22.1)	(14.7)	(14.4)	(22.0)	(20.5)	(13.0)
(1952-53)	(26.2)	(20.5)	(13.6)	(13.5)	(19.3)	(19.9)	(13.4)

*Nuclear Engineering

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs
(January, 1959) File No. 21-2132

Table 204-b. Weighted Average Size of Upper-division Undergraduate Classes Taught in Each Subject-field at Each Institution During Regular Academic Year 1957-58

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mex. Military Instit.
Agriculture		10.8			14.1		
Anthropology	17.3			-		20.0	
Art	14.3	6.1	7.3	8.5	3.0		
Biology	17.2	9.4	15.8	7.3	12.6	-	-
Business Admin.	33.6	8.9	13.1	16.8	16.4	5.0	-
Chemistry	16.1	19.0	7.7	5.3	9.1	7.9	-
Economics	24.7	9.7		18.3			-
Education	23.6	16.2	19.6	27.0	26.2		
Engineering:							
Architectural	13.6						
Chemical	13.9	11.7					
Civil	23.1	23.5					
Electrical	23.2	28.2					
General	25.5"				3.0	26.0	
Mechanical	21.9	21.5					
Met., Min., Pet.						6.4	
English	21.2	11.7	10.1	10.7	17.4	33.0	-
French	8.3	-	-	-	-		-
Gen. Education			-	-	17.0		
Geography	17.6	7.7	32.7	4.7	14.7		-
Geology	26.4	-		-	8.1	10.1	-
German	5.6	3.0	2.6	-	-	-	-
Government	23.3	6.4	16.0	14.7	10.0	22.0	-
Greek	1.5	.	.	.	6.0		
History	29.3	17.5	17.8	7.3	17.5		-
Home Economics	20.8	5.8	5.4	4.5	5.2		
Industrial Arts	11.5		6.8	2.0	8.0		
Journalism	9.9	1.5	7.4	2.5	6.6		
Latin	4.5						
Law	21.7						
Mathematics	23.0	24.9	7.5	5.5	12.8	10.9	-
Military Science	10.8	10.3					
Music	12.8	4.5	8.9	2.2	10.3		
Nursing	4.4						
Pharmacy	10.1						
Philosophy	13.9		13.0		6.4		
Physical Education	12.7	6.3	12.4	15.0	17.9	9.1	
Physical Science				11.0			
Physics	14.0	8.7	11.6	-	5.9	14.7	-
Portuguese	12.6						
Psychology	24.2	25.9	14.2	35.2	15.2		-
Religion					9.2		
Russian	-	-					
Social Science	-	15.0	12.0			-	
Sociology	23.3	10.4	12.3	16.5	16.3		
Spanish	16.4	6.9	9.2	10.0	3.8	-	-
Speech & Dramatics	10.2	9.0	6.0	6.8	4.5	10.0	
TOTALS: 1957-58	19.9	15.2	12.5	13.7	13.3	10.7	-
(1956-57)	(18.4)	(13.8)	(11.5)	(13.5)	(12.5)	(10.4)	-
(1955-56)	(15.9)	(12.4)	(11.1)	(12.2)	(12.6)	(10.5)	(6.6)
(1954-55)	(15.9)	(12.1)	(9.6)	(9.1)	(10.9)	(8.6)	(9.1)
(1953-54)	(15.0)	(10.9)	(7.5)	(9.2)	(8.2)	(8.0)	(9.6)
(1952-53)	(15.9)	(10.8)	(6.9)	(8.8)	(7.7)	(7.7)	(8.6)

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO

Analysis of Class Size and Teaching Loads 1957-58, College-level Programs

File No. 21-2133

(January, 1959)

Table 204-c. Weighted Average Size of Graduate Classes Taught in Each Subject-field at Each Institution During Regular Academic Year 1957-58

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		2.3			-	-	
Anthropology	1.7			-			
Art	1.4	1.0	2.6	1.0	1.0	-	-
Biology	1.8	2.8	6.3	-	-	-	-
Business Admin.	8.0	-	-	-	4.9	-	-
Chemistry	5.5	4.4	4.1	-	2.1		-
Economics	3.1	-		-			
Education	9.4	11.5	17.0	8.6	7.6		
Engineering:							
Architectural	-						
Chemical	-	-					
Civil	3.7	9.5					
Electrical	9.7	13.0				-	
General	29.8**				-		
Mechanical	5.3	6.0				-	
Met., Min., Pet.						-	-
English	3.2	5.0	-	1.0	4.7		-
French	1.8	-	-	-	-		
Gen. Education			-	-	-		-
Geography	-	-	-	-	1.0	-	-
Geology	3.9	-		-	-	-	-
German	-	-	-	-	-	-	-
Government	2.1	2.0	5.5	-	2.4		
Greek	-				-	-	-
History	2.0	3.5	3.5	-	8.7		
Home Economics	-	1.0	-	-	-		
Industrial Arts	-		-	-	-		
Journalism	-	-	-	-	-		
Latin	-						
Law	-					-	-
Mathematics	7.7	5.0	-	-	3.7		
Military Science	-	-					
Music	4.0	-	3.4	-	1.4		
Nursing	-						
Pharmacy	-						
Philosophy	2.2		-		-	-	
Physical Education	7.3	-	4.0	-	4.6		
Physical Science				-		2.5*	-
Physics	6.4	5.4	-	-	-		
Portuguese	-						-
Psychology	2.6	7.4	11.3	16.7	6.7		
Religion					1.0		
Russian	-	-				-	
Social Science	-	-	-				
Sociology	4.0	1.0	-	-	-	-	-
Spanish	4.1	2.3	4.0	-	-	-	
Speech & Dramatics	1.0	-	-	-	7.0		
TOTALS: 1957-58	5.1	6.0	7.6	8.1	4.2	2.5	-
(1956-57)	(4.9)	(6.1)	(4.7)	(12.3)	(5.4)	(2.9)	
(1955-56)	(3.6)	(4.7)	(5.5)	(18.0)	(3.9)	(2.4)	
(1954-55)	(3.6)	(6.4)	(3.6)	(13.2)	(3.0)	(2.4)	
(1953-54)	(3.5)	(5.7)	(2.4)	(9.9)	(2.1)	(3.0)	
(1952-53)	(5.2)	(4.6)	(2.7)	(7.5)	(3.6)	(3.0)	

*Geophysics ** Nuclear Engineering

Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs

(January, 1959) File No. 21-214

Table 206. Average Credit Hours Teaching Each Term or Semester per Full-time-equivalent Faculty Member in Each Subject-field at Each Institution During Regular Academic Year 1957-58

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		13.8			18.7*		
Anthropology	17.5			15.0*		10.5*	
Art	11.4	13.5	12.2	11.9	18.0		
Biology	11.7	11.7	16.1	12.8	16.0	14.0*	12.0
Business Admin.	9.8	13.5	16.2	13.8	15.3	10.5*	17.9*
Chemistry	9.3	10.0	11.6	14.1	16.3	8.9	14.8
Economics	12.8	11.1		14.4*			15.0*
Education	12.9	15.9	15.2	16.3	11.5		
Engineering:							
Architectural	8.6						
Chemical	9.2	10.2					
Civil	15.3	13.5					
Electrical	11.4	12.1					
General	10.8*(a)				11.7	9.7	
Mechanical	11.6	12.5					
Met., Min., Pet.						13.0	
English	12.6	11.9	11.7	16.6	14.7	12.0	14.3
French	12.1	18.2*	18.3*	13.5*	22.5*		17.5*
Gen. Education			11.7*	16.9*	14.7		
Geography	13.5	14.5*	16.6*	15.0*	14.5		15.0*
Geology	11.5	14.5*		12.0*	11.7	10.1	18.5*
German	12.1	18.0*	18.3*	15.0*	13.5*	12.0*	17.5*
Government	11.4	15.8	15.3*	17.8*	27.0*	10.5*	15.0*
Greek	13.0*				16.1*		
History	11.2	15.9	16.1	15.0*	16.9		17.3*
Home Economics	10.7	9.3	13.0	10.0	15.7		
Industrial Arts	10.5		14.8	31.2	16.5		
Journalism	11.2	14.0*	17.8*	10.0*	15.7*		
Latin	13.0*						
Law	7.2						
Mathematics	11.5	13.0	13.0	15.0*	16.1	13.2	15.6
Military Science	(Data not comparable - omitted from this table.)						
Music	6.9	11.8	8.4	10.3	10.2		
Nursing	8.7						
Pharmacy	8.8						
Philosophy	11.6		14.0		12.0		
Physical Education	10.0	9.1	8.7	10.8	10.1	5.6	
Physical Science				15.0*			
Physics	9.7	14.8	15.8	12.0*	14.2	13.0**	15.0
Portuguese	11.5*						
Psychology	11.0	13.7	15.6	17.3	12.7		16.2*
Religion					14.4		
Russian	8.3	18.0*					
Social Science	12.1	17.0*	15.7			10.5*	
Sociology	11.9	13.0	15.1*	15.0*	14.1*		
Spanish	10.0	15.8	16.8	13.9*	22.5*	15.0*	16.2*
Speech & Dramatics	11.3	10.1	13.9	15.4	15.6	12.0*	
TOTALS: 1957-58	11.0	12.6	13.1	14.7	14.1	11.2	15.5
(1956-57)	(11.3)	(12.7)	(13.1)	(14.1)	(14.0)	(11.9)	(13.5)
(1955-56)	(12.3)	(13.0)	(13.2)	(14.3)	(13.5)	(13.4)	(15.8)
(1954-55)	(12.4)	(12.9)	(14.5)	(13.9)	(15.0)	(12.2)	(14.1)
(1953-54)	(12.0)	(13.5)	(15.8)	(14.7)	(14.0)	(12.8)	(14.7)
(1952-53)	(11.5)	(12.4)	(14.8)	(15.6)	(14.2)	(11.7)	(13.9)

*Less than one full-time-equivalent instructor. (a) Nuclear Engineering

** Includes Graduate Geophysics

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO

Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs

(January, 1959)

File No. 23-2241

ble 207-a. Average Lower-division Student-credit (semester hours) Hours Produced Annually per Full-time-equivalent Faculty Member

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mex. Military Institute
Agriculture		470.3			669.6*		
Anthropology	2701.7*			636.6*		-	
Art	468.6	466.9	472.2	316.1*	801.5		
Biology	723.0	514.5	1081.1*	466.6	632.4*	161.1*	376.0
Business Admin.	629.6	655.6	752.9	493.1	667.5	-	497.0*
Chemistry	762.4	705.5	568.0	533.0*	1180.5*	457.6	363.0
Economics	901.7	767.1		991.0*			540.5*
Education	707.0	1400.6*	897.8*	-	1144.0*		
Engineering:							
Architectural	707.9						
Chemical	317.7*	384.0*					
Civil	697.4	724.8					
Electrical	511.5	621.9*					
General	-*(a)				312.1	328.6*	
Mechanical	411.0	713.5					
Met., Min., Pet.						-	
English	656.6	579.6	460.3	797.2	756.6	470.6	476.0
French	489.2	292.0*	146.5*	202.7*	480.5*		219.8*
Gen. Education			832.5*	1401.1*	1794.7		
Geography	1558.6*	855.1*	-	1231.2*	589.4*		480.5*
Geology	762.3	478.3*		575.5*	526.6*	532.1*	608.6*
man	742.6	566.5*	320.5*	420.4*	427.9*	191.8*	134.9*
Government	1414.5*	861.7*	623.1*	1329.6*	1324.3*	-	410.4*
Greek		-			-		
History	1068.9	1015.9	858.9*	760.8*	1046.6*		694.3
Home Economics	441.3	344.9	257.6*	209.1*	312.3*		
Industrial Arts	330.5*		320.2	495.9	433.0		
Journalism	438.8*	140.1*	296.6*	160.0*	254.5*		
Latin	324.7*						
Law	-						
Mathematics	788.3	774.4	512.9	466.3*	891.6	627.6	376.7
Military Science		(Data not comparable - omitted from this table.)					
Music	247.0	317.6	306.1	291.0	246.6		
Nursing	157.3						
Pharmacy	314.2						
Philosophy	1062.4		778.1*		300.3*		
Physical Education	462.5	385.3	276.2	530.2	502.5	214.1*	
Physical Science				-			
Physics	536.4	722.2	573.9*	251.8*	737.4*	589.8	378.0
Portuguese	333.3*						
Psychology	941.1	1295.8	929.0*	851.4*	1191.5*		535.7*
Religion					477.1		
Russian	260.9	323.7*					
Social Science	1189.0	-	1186.9			793.1*	
Sociology	856.4	845.1*	476.2*	1531.5*	1171.2*		
Spanish	394.6	256.0	258.3*	363.5*	585.6*	165.2*	521.8*
Speech & Dramatics	448.2	337.4	580.5	341.1*	658.4	-	
ALS: 1957-58	651.4	610.7	510.2	525.6	657.1	488.8	436.4
(1956-57)	(655.4)	(576.5)	(457.9)	(493.8)	(705.2)	(529.1)	(314.0)
(1955-56)	(680.5)	(609.7)	(474.8)	(534.8)	(652.6)	(527.3)	(287.4)
(1954-55)	(675.2)	(594.1)	(532.3)	(409.7)	(826.8)	(489.2)	(292.9)
(1953-54)	(580.1)	(553.4)	(408.9)	(435.0)	(615.6)	(479.6)	(379.1)
(1952-53)	(589.3)	(487.6)	(378.4)	(403.1)	(508.2)	(439.3)	(376.7)

*Less than one full-time-equivalent instructor at indicated level. (a) Nuclear Engineering

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs
(January, 1959) File No. 23-2243

Table 207-c. Average Graduate Student-credit Hours (semester hours) Produced Annually per Full-time-equivalent Faculty Member

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mex. Military Institute
Agriculture		88.9			-		
Anthropology	59.9			-		-	
Art	40.1	27.0*	63.3*	28.7*	36.0*		
Biology	62.4	69.2	211.5*	-	-	-	-
Business Admin.	187.4	-	-	-	171.5*	-	-
Chemistry	157.0	90.1	99.2*	-	67.6*	-	-
Economics	83.4*	-		-			-
Education	242.7	401.3	411.2*	266.0	188.3*		
Engineering:							
Architectural	-						
Chemical	-	-					
Civil	130.5	257.8*					
Electrical	241.6	454.9*					
General	611.5*(a)				-	-	
Mechanical	165.1	144.5*					
Met., Min., Pet.						-	
English	101.7	98.1*	-	42.0*	140.1*	-	-
French	56.4*	-	-	-	-		-
Gen. Education			-	-	-		
Geography	-	-	-	-	29.0*		-
Geology	112.1	-		-	-	-	-
German	-	-	-	-	-	-	-
Government	49.8	66.0*	168.2*	-	130.9*	-	-
Greek	-				-		
History	72.6	115.5*	109.4*	-	286.5*		-
Home Economics	-	4.0*	-	-	-		
Industrial Arts	-		-	-	-		
Journalism	-	-	-	-	-		
Latin	-						
Law	-						
Mathematics	180.3*	114.0	-	-	117.1*	-	-
Military Science	-	-					
Music	76.7*	-	85.5*	-	24.9		
Nursing	-						
Pharmacy	-						
Philosophy	55.2*		-		-		
Physical Education	213.0*	-	78.4*	-	101.6*	-	
Physical Science				-			
Physics	174.9	191.3*	-	-	-	65.7**	-
Portuguese	-						
Psychology	77.7*	194.0*	345.3*	768.0*	173.1		-
Religion					36.0*		
Russian	-	-					
Social Science	-	-	-			-	
Sociology	89.4*	21.0*	-	-	-		
Spanish	96.2	75.1*	133.3*	-	-	-	-
Speech & Dramatics	24.9*	-	-	-	216.7*	-	
TOTALS: 1957-58	144.8	167.8	200.2	269.6	119.0	65.7	-
(1956-57)	(135.0)	(186.4)	(121.0)	(358.9)	(134.6)	(85.0)	
(1955-56)	(111.6)	(143.4)	(126.8)	(491.7)	(121.6)	(175.5)	
(1954-55)	(120.3)	(197.3)	(113.0)	(355.1)	(88.4)	(89.2)	
(1953-54)	(112.0)	(185.7)	(106.7)	(315.0)	(74.6)	(117.5)	
(1952-53)	(140.7)	(146.4)	(86.2)	(264.8)	(117.0)	(111.6)	

*Less than one full-time equivalent instructor at indicated level.
**Geophysics (a) Nuclear Engineering

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO

Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs

(January, 1959)

File No. 21-216

'able 211. Instructional Salary Cost per Student-credit-hour Produced, All Levels Combined

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		$23.54			$9.09		
Anthropology	$9.62			$10.17		$14.05	
Art	17.76	17.78	$17.46	23.49	10.46		
Biology	9.89	16.37	9.37	13.84	11.56	41.70	$17.86
Business Admin.	9.30	16.06	9.73	9.99	10.28	56.20	9.69
Chemistry	8.43	10.33	20.16	17.97	12.08	19.77	16.02
Economics	9.48	11.96		6.42			8.50
Education	13.00	13.47	8.72	11.06	10.44		
Engineering:							
Architectural	9.60						
Chemical	25.60	21.39					
Civil	12.12	10.23					
Electrical	15.31	8.85					
General	7.37*				22.00	15.67	
Mechanical	16.04	10.23					
Met., Min., Pet.						42.42	
English	9.44	10.71	13.82	9.36	9.42	11.57	14.25
French	13.68	17.33	38.16	28.98	13.34		29.00
Gen. Education			8.06	3.70	3.40		
Geography	6.82	13.11	5.92	14.23	15.83		9.56
Geology	9.52	16.00		9.48	18.44	23.71	10.22
German	8.15	13.30	24.38	5.36	19.18	40.63	33.96
Government	12.88	11.61	12.44	8.21	18.56	12.77	11.20
Greek	128.22				(a)		
History	8.90	7.80	12.84	11.02	9.95		7.70
Home Economics	12.34	29.92	21.95	42.55	25.59		
Industrial Arts	18.49		18.67	15.04	17.66		
Journalism	27.63	87.75	19.87	55.70	19.06		
Latin	19.56						
Law	22.77						
Mathematics	7.73	8.59	9.92	16.43	10.98	12.90	15.97
Military Science	(a)	(a)					
Music	27.47	22.77	19.05	26.41	25.68		
Nursing	49.05						
Pharmacy	26.83						
Philosophy	9.66		10.80		32.30		
Physical Education	14.20	23.60	23.09	12.11	15.02	33.17	
Physical Science				18.15			
Physics	12.96	12.49	9.81	21.67	13.53	19.77**	16.85
Portuguese	27.11						
Psychology	7.31	8.72	10.15	5.85	12.04		10.73
Religion					(a)		
Russian	22.77	17.00					
Social Science	5.47	12.85	5.14			7.44	
Sociology	10.98	16.82	11.84	6.99	9.07		
Spanish	14.69	31.33	22.09	14.84	17.19	29.76	11.01
Speech & Dramatics	16.96	18.45	11.89	19.16	14.32	24.57	
TOTALS: 1957-58	11.55	12.95	13.15	12.45	12.08	19.14	13.56
(1956-57)	(11.32)	(12.87)	(14.61)	(11.81)	(10.11)	(16.36)	(17.37)
(1955-56)	(11.21)	(12.56)	(12.84)	(10.92)	(9.86)	(15.10)	(17.24)
(1954-55)	(10.74)	(11.62)	(12.05)	(11.56)	(8.09)	(17.84)	(15.83)
(1953-54)	(12.57)	(13.01)	(15.56)	(11.52)	(10.19)	(17.79)	(12.33)
(1952-53)	(11.73)	(12.98)	(17.92)	(11.07)	(11.12)	(20.96)	(12.51)

*Nuclear Engineering. **Includes Graduate Geophysics. (a) No charge made to institution for instructional services; SCH produced in this subject-field omitted from calculation of unit cost.

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO
Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs
(January, 1959) File No. 21-2161

Table 211-a. Instructional Salary Cost per Lower Division Undergraduate Student-credit-hours Produced

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		$15.56			$8.49		
Anthropology	$2.99			$10.17		-	
Art	12.77	13.78	$11.72	17.41	7.52		
Biology	5.85	10.91	6.65	11.28	9.82	$41.70	$17.86
Business Admin.	7.55	9.03	7.49	9.74	8.27	-	9.69
Chemistry	5.42	8.17	12.07	11.25	5.16	14.61	16.02
Economics	5.83	7.55		4.86			8.50
Education	8.35	5.01	6.76	-	5.07		
Engineering:							
Architectural	8.45						
Chemical	25.94	18.79					
Civil	9.52	7.96					
Electrical	10.70	7.55					
General	-*				20.21	17.06	
Mechanical	14.52	7.59					
Met., Min., Pet.						-	
English	7.70	9.57	11.99	6.93	7.76	14.03	14.25
French	11.51	17.33	38.16	28.98	13.34		29.00
Gen. Education			8.06	3.70	3.26		
Geography	3.66	8.95	-	4.77	11.70		9.56
Geology	6.06	16.00		9.48	11.48	13.48	10.22
German	6.72	9.71	17.44	5.36	19.18	40.63	33.96
Government	4.45	7.13	9.77	5.27	6.57	-	11.20
Greek	-				-		-
History	4.47	4.96	7.91	7.91	6.61		7.70
Home Economics	11.38	16.08	17.17	27.68	18.23		
Industrial Arts	17.85		17.61	12.68	14.57		
Journalism	14.13	46.80	18.24	32.75	16.42		
Latin	15.39						
Law	-						
Mathematics	6.33	6.66	9.00	13.88	7.15	11.10	15.97
Military Science	(a)	(a)					
Music	22.90	19.47	16.36	17.48	22.41		
Nursing	38.93						
Pharmacy	17.29						
Philosophy	5.93		8.75		19.35		
Physical Education	11.71	15.83	20.79	10.18	11.44	25.55	
Physical Science				-			
Physics	7.62	8.90	8.64	21.67	8.69	12.55	16.85
Portuguese	25.49						
Psychology	4.72	5.63	5.54	6.78	5.26		10.73
Religion					(a)		
Russian	22.77	17.00					
Social Science	5.47	-	4.98			7.44	
Sociology	6.47	8.65	10.97	3.84	4.40		
Spanish	11.80	25.47	23.23	13.07	10.94	29.76	11.01
Speech & Dramatics	14.44	17.29	9.52	15.80	10.21	-	
TOTALS: 1957-58	7.98	9.58	10.99	10.35	8.93	13.59	13.56
(1956-57)	(7.81)	(9.59)	(11.70)	(10.66)	(7.26)	(11.64)	(17.37)
(1955-56)	(7.39)	(8.95)	(10.13)	(9.20)	(7.19)	(10.84)	(16.38)
(1954-55)	(7.04)	(8.43)	(8.91)	(9.81)	(5.48)	(11.17)	(15.60)
(1953-54)	(8.37)	(9.33)	(11.66)	(9.40)	(7.30)	(11.66)	(11.63)
(1952-53)	(8.26)	(9.81)	(12.52)	(9.64)	(8.22)	(12.73)	(11.38)

*Nuclear Engineering. (a) No charge made to institution for instructional services; SCH produced in this subject-field omitted from calculation of unit cost.

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO

Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs

File No. 21-2162

(January, 1959)

Table 211-b. Instructional Salary Cost per Upper-Division Undergraduate Student-credit Hour Produced

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		$25.09			$11.45		
Anthropology	$13.40			-		$14.05	
Art	19.07	46.76	$28.98	$26.26	54.46		
Biology	13.55	31.29	12.36	28.07	13.92	-	-
Business Admin.	9.04	28.79	13.53	10.37	12.37	56.20	-
Chemistry	15.08	15.73	34.80	40.69	21.70	41.19	-
Economics	8.52	40.28		10.16			-
Education	10.25	13.05	8.48	6.64	11.70		
Engineering:							
Architectural	27.06						
Chemical	25.51	23.72					
Civil	10.08	10.21					
Electrical	13.30	8.54					
General	9.92*				85.58	10.41	
Mechanical	13.99	11.25					
Met., Min., Pet.						42.42	
English	11.44	23.24	24.94	18.22	13.36	8.65	-
French	22.71	-	-	-	-		-
Gen. Education			-	-	13.61		
Geography	12.02	34.43	5.92	41.93	16.18		-
Biology	9.58	-		-	32.01	32.56	-
German	44.59	51.00	57.88	-	-	-	-
Government	14.45	30.64	11.59	12.95	16.10	12.77	-
Greek	128.22				(a)		
History	11.98	11.32	10.15	27.31	11.77		-
Home Economics	13.58	48.40	31.22	66.86	33.86		
Industrial Arts	19.97		26.82	64.80	23.47		
Journalism	35.66	156.00	20.63	104.67	25.36		
Latin	42.74						
Law	22.77						
Mathematics	12.05	9.95	29.25	39.21	18.09	23.83	-
Military Science	(a)	(a)					
Music	35.85	50.24	28.13	110.63	23.14		
Nursing	60.14						
Pharmacy	34.74						
Philosophy	19.58		18.69		37.37		
Physical Education	20.74	63.00	22.22	14.97	15.71	49.58	
Physical Science				18.15			
Physics	15.08	25.13	15.46	-	41.34	16.48	-
Portuguese	29.33						
Psychology	9.95	9.90	11.17	4.99	13.52		-
Religion					(a)		
Russian	-	-					
Social Science	-	12.85	13.54			-	
Sociology	12.76	27.68	12.26	11.86	12.61		
Spanish	14.67	27.29	18.92	21.73	37.20	-	-
Speech & Dramatics	30.37	32.91	32.48	26.36	44.24	24.57	
TOTALS: 1957-58	14.22	16.71	15.78	14.69	16.18	26.75	-
(1956-57)	(14.92)	(17.48)	(17.88)	(13.36)	(14.82)	(23.09)	-
(1955-56)	(14.99)	(18.81)	(17.25)	(14.52)	(14.36)	(23.03)	(22.02)
(1954-55)	(14.84)	(17.79)	(17.85)	(15.52)	(14.24)	(27.68)	(16.32)
(1953-54)	(17.27)	(23.75)	(20.04)	(15.28)	(18.31)	(26.94)	(15.20)
(1952-53)	(15.45)	(19.00)	(22.56)	(12.99)	(17.32)	(31.51)	(18.12)

*Nuclear Engineering. (a) No charge made to institution for instructional services; SCH produced in this subject-field omitted from calculation of unit cost.

BOARD OF EDUCATIONAL FINANCE, STATE OF NEW MEXICO

Analysis of Class Size and Teaching Loads, 1957-58, College-level Programs

(January, 1959) File No. 21-2163

Table 211-c. Instructional Salary Cost per Graduate Student-credit Hour Produced

Department	University of New Mexico	New Mexico College of A & M A	Highlands University	New Mexico Western College	Eastern N. Mex. Univer.	N.M. Inst. of Mining & Tech.	New Mexico Military Institute
Agriculture		$82.45			-		
Anthropology	$134.02			-		-	
Art	172.87	292.33	72.75	190.00	$147.33		
Biology	104.16	96.59	34.46	-	-	-	-
Business Admin.	39.84	-	-	-	38.47	-	-
Chemistry	47.08	68.49	62.40	-	91.83	-	-
Economics	82.69	-		-			-
Education	29.74	15.53	15.77	23.78	37.00		
Engineering:							
Architectural	-						
Chemical	-	-					
Civil	55.99	27.97					
Electrical	29.72	19.84					
General	6.27*				-	-	
Mechanical	46.92	46.44					
Met.,Min.,Pet.							-
English	81.20	78.47	-	151.75	48.57	-	-
French	102.36	-	-	-	-		-
Gen. Education			-	-	-		
Geography	-	-	-	-	238.00		-
Geology	55.41	-		-	-	-	-
German	-	-	-	-	-	-	-
Government	151.70	81.83	34.91	-	66.52	-	-
Greek	-				-		
History	108.72	56.93	60.13	-	25.93		-
Home Economics	-	2448.00	-	-	-		
Industrial Arts	-		-	-	-		
Journalism	-	-	-	-	-		
Latin	-						
Law	-						
Mathematics	53.61	54.14	-	-	63.09	-	-
Military Science	-	-					
Music	91.19	-	66.50	-	242.47		
Nursing	-						
Pharmacy	-						
Philosophy	138.95		-		-		
Physical Education	32.85	-	75.08	-	73.76	-	
Physical Science				-			
Physics	43.22	32.38	-	-	-	92.61**	-
Portuguese	-						
Psychology	100.62	39.67	15.85	8.92	37.91		-
Religion					(a)		
Russian	-	-					
Social Science	-	-	-			-	
Sociology	85.00	381.67	-	-	-		
Spanish	80.37	83.62	45.00	-	-	-	-
Speech & Dramatics	292.67	-	-	-	33.62	-	
TOTALS: 1957-58	50.65	41.03	30.05	23.50	56.85	92.61	-
(1956-57)	(51.41)	(33.46)	(47.32)	(16.00)	(40.27)	(69.12)	
(1955-56)	(59.66)	(45.40)	(42.27)	(10.83)	(47.48)	(30.84)	
(1954-55)	(50.47)	(28.82)	(43.72)	(9.71)	(59.42)	(66.70)	
(1953-54)	(53.80)	(27.89)	(47.40)	(14.36)	(62.67)	(53.18)	
(1952-53)	(42.66)	(34.84)	(58.43)	(15.39)	(40.43)	(47.92)	

*Nuclear Engineering. **Geophysics (a) No charge made to institution for instructional services; SCH produced in this subject-field omitted from calculation of unit cost.

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CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

INSTRUCTIONS FOR FORM L-1

The data collected on Form L-1 will be used in the calculation of such measurements as the number of students and the number of credit-hours and clock-hours of instruction in each class at each level of each subject field, teaching loads per faculty member, scheduled utilization of instructional rooms (classrooms, seminar rooms, and teaching laboratories), and distribution of classes by subject field, by level and type of instruction, by size, by time of day, by day of week, etc. These measurements will be basic elements of the calculation and analysis of unit costs and unit floor areas in each department and subject field. (In these instructions the term "department" refers to an institution's administratively-separate unit in accordance with that institution's organizational structure. The term "subject field" refers to subject-matter area of instruction and research in accordance with a standard classification, irrespective of organizational structure.)

To permit valid conclusions to be drawn from a statistical analysis of the class schedules reported on Form L-1, every listing must be a realistic representation, even though not always a literal description, of the actual circumstances as to time, place, and type of instruction. Fortunately, most classes or sections consist of organized groups of students, each group meeting in a single room for a specific type of instruction at given unvarying hours on certain days of each week throughout the semester or quarter. The only real difficulty arises from the necessity of tabulating all organized classes in the pattern established by the majority. In almost every instance, however, the exercise of a little care and ingenuity by an informed person will permit the more complicated schedules to be reported on Form L-1 in terms which are equivalent to the actual circumstances, and which can logically be tabulated in the same pattern as that of the simpler schedules. The principal thing to be kept in mind is that each listing of an organized class on Form L-1 should accurately represent, even if only as an average, (a) the number of hours that a group of students under one instructor met in a specified part of the physical plant, (b) the number of enrolled students scheduled each hour in the space correspondingly identified in the physical inventory reported on Form P-1, and (c) for each type of instruction, the number of weekly clock-hours per student, irrespective of the formal organization of sections.

The institution's formal records may show, for example, only the total enrollment and a single schedule and room assignment of a course or administratively-separate section which (a) was organized and taught as two or more groups that should be reported on Form L-1 as individual "sections" because each group had an individual instructor, or (b) was distributed among two or more rooms, each room having been utilized all the scheduled hours but by only part of the group of students at any given time, or (c) was organized as one or more groups that met entirely in one room during some of the scheduled hours and entirely in another room during the remaining scheduled hours. Or, for example, the institution's formal records may list some classes simply as "to be arranged" or "was arranged", and the records may never have been made more informative as to the schedules and room assignments that developed when the class was organized. In all such cases, a special effort must be made to insure that the report on Form L-1 is a realistic listing of the actual schedule and location of all instruction which was conducted in the form of organized classes.

In some instances, the students constituting a single class under one instructor are represented in the institution's formal records by entries under two or more course numbers or titles because the individual students received credit under those two or more course designations. A common example is a music, art, or speech course with a multiple course number reflecting the fact that some students received credit under one course number and other students received credit under another. Sometimes the two or more formal listings appear in the catalog or printed schedule as if they represented separate classes in different departments. In every such case, the institution's report on Form L-1 will account for all students in the group under one course number, unless separate course designations for separate sub-groups are necessary for accurate portrayal of essentially different levels of instruction within the class.

The report on Form L-1 must, furthermore, include all instruction which was conducted in the form of individual study or research, including that for which there was no formal assignment of time or credit-value but for which an allocation of staff time is reported on Form L-2 and/or an allocation of "other expense" is reported on Form L-3. For the purposes of this study, therefore, all non-credit and zero-credit courses, including informal individual study and research by registered students whose supervision involved staff time and/or "other expense", must be assigned a credit-value equal to that normally assigned to such work; and the enrollment and average credit-value so reported for a given level of a given subject field must be assigned a unique course number consistent with the institution's pattern of course numbering. It is not, however, necessary that scheduled hours or location be specified for any instruction that was conducted as individual study or research; and in such cases an instructor's name should be listed only if the direct supervision of the student or students reported as a "section" on that line of Form L-1 was the more or less exclusive responsibility of the one listed instructor. (Any scheduled use of classrooms, seminar rooms, or teaching laboratories--e.g., for a weekly meeting of a group of students engaged in individual study or research--should be reported in all details as an organized class.)

In most institutions, therefore, the necessary degree of completeness and accuracy cannot be achieved by the mere clerical operation of transcribing data from existing formal records. In addition to the circumstances already discussed, a considerable number of the listings in published schedules and directories are nominal; e.g., the room listed as the location of a class may have been simply the point of assembly for a section that was conducted in another room or was held as an outdoor class or field trip, or (as happened in an earlier survey) the reported room number for a large number of students enrolled as a single group in a laboratory course was merely that of a stockroom near which was located the bulletin board on which were posted the laboratory room assignments of the several sections into which the class was divided. In some cases, the formal records do not include the enrollments, schedules, and room assignments of all individual laboratory, quiz, recitation, and discussion sections. And frequently the formal records are not sufficiently detailed to enable a clerk or typist to realize that certain classes, each listed in the records under just one course number, comprised both lecture and laboratory sections--or that a certain single section received both lecture and laboratory instruction, and should be so reported on Form L-1, even though there was no formal organization into two types of section.

Accomplishment--or at least the very close supervision of the accomplishment--of this form by persons familiar with the organization of the institution's instruction and able to exercise mature judgment in selecting the manner of reporting each class is also dictated by the necessity of achieving complete uniformity in the application of the Study's "Standard Classification of Subject Fields, Services, and Related Accounts" to the teaching and research programs, to the allocation of expenditures to all various functions and services, and to the statistical distribution of floor areas.

DEFINITIONS AND DESCRIPTIONS OF THE ITEMS ON FORM L-1

The following definitions and descriptions apply particularly to the Forms L-1 to be prepared for the fall semester or quarter of the academic year 1954-55. The only difference in the reporting of the spring semester or winter and spring quarters (1954-55) is that columns 17-20 will be omitted in those cases. *Completely* excluded from Form L-1 (but to be covered later in much less detail) are the following programs:

(1) All adult education, correspondence courses, and other extension programs, including workshop institutes and conferences, "short courses", and the like.

(2) All summer session and summer quarter programs.

(3) All courses given by departments of colleges and schools of dentistry, medicine, nursing, pharmacy, and public health. (*Exception*: Forms L-1 *will* be completed for any part of such programs given by departments which (a) are located on a liberal arts campus, and (b) are not physically part of the institution's medical center. For example, Indiana University will report the teaching programs of its Medical School departments on the Bloomington campus but not those of its Medical Center in Indianapolis; and the University of California will report the teaching programs of its Schools of Medicine, Nursing, and Public Health departments on the Berkeley campus, but not those given by departments of and in its Medical Centers at Los Angeles and San Francisco.)

As illustrated on the sampleForms L-1, appropriate entries will be made on all blank lines at the top of the form. (No entries are to be made in the lettered blocks, which are for IBM code numbers to be filled in by the Central Study Staff.) Only one Form L-1 (of the necessary number of pages) will be required for reporting the instructional program of a department *if* (a) each course given by that department is *uniquely* identified by a combination of the key word of the department's name and a numerical designation (e.g., Geology 121A), *and* (b) all courses given by the department were confined to *one* of the finest numerically-coded subdivisions of the Study's "Standard Classification" (e.g., 2300 - EARTH SCIENCES, or 4402 - FRENCH). If, however, (a) the name identifying a "division" of a department must be used in conjunction with the numerical designation of a course in order to avoid duplication (e.g., Latin 101 and Greek 101 in the Department of Classical Languages), *and/or* (b) the department's courses cover more than one of the Study's specific subject fields (e.g., a Department of Foreign Languages, a Department of English or Speech that includes Drama, or a Department of Physical Sciences), then a separate Form L-1 will be completed for each division of the department *and/or* each specific subject field covered by the department. And if more than one department is involved in a given subject field (e.g., in Agriculture or the Biological Sciences), a separate Form L-1 will be completed for each department.

A separate Form L-1 will be prepared for each department, division of a department, and subject field in which instruction was offered in the academic year 1954-55, except as noted above, but courses in which there was zero enrollment will not be listed. The complete set of Forms L-1 of a given semester or quarter for a given campus or branch will be arranged in alphabetical order of colleges and schools, and in alphabetical order of departments within each college or school. All pages of each such set of Forms L-1 will be serially numbered in a single series and will be preceded by a summary list and index (typewritten double-space), as follows:

Heading: Institution, campus or branch, and semester or quarter.

Column 1: College or school, and department. (Please block-indent department names under each college or school name in the same alphabetical order as that of the Forms L-1.)

Column 2: Standard 4-digit code and abbreviation of specific subject field(s) covered in whole or in part by, and separately reported for, each department. (Please give cross-references on subject fields reported under more than one department. Wherever more than one subject field is reported under one department, please mark with an asterisk the one which represents the department's major emphasis, i.e., the one subject field in terms of which the entire department would be best classified or identified in a summary tabulation of departmental totals supplementing a detailed tabulation of costs and cost-factors for individual levels of instruction in individual subject fields.)

Column 3: Page numbers of the Form(s) L-1 for each department and subject field.

One copy of the covering summary list and Forms L-1 of each semester or quarter for each campus or branch will be transmitted to the Central Study Staff. The complete collection of such sets will be assembled and transmitted by the institution in 3-ring loose-leaf binders (not binders with posts, clips, or spiral binding). Preferably, each report of a given semester or quarter for a given campus or branch will be placed in a suitably labeled separate binder; but, two or more small reports may be placed in one binder if dividers with identifying tabs are placed between reports.

With the complete collection of reports, the institution will transmit a complete set of all published catalogs, bulletins, schedules, and directories pertaining to the reported courses, classes, and instructors. The catalog or other document describing each course will be appropriately annotated by the institution in accordance with any listings of course numbers on Form L-1 that are different from those printed in the catalog. It will not, however, be necessary for any printed documents listing class schedules and room assignments to be corrected or annotated to agree with the corresponding (and presumably more complete and accurate) listings on Form L-1.

The institution's letter of transmittal will include an explicit statement or appended list identifying the offices and agencies that prepared, reviewed, and approved the reports on Form L-1. In most institutions, Form L-1 will be best filled in by the Registrar but will have to be reviewed and revised by department chairmen to secure complete accuracy in the listing of all sections and all instructors thereof. In some cases, the report will have to originate in the departments and then be reviewed by a central agency. In all cases, every effort will be made to achieve completeness and accuracy. (Nevertheless, judging from the Central Study Staff's experience, errors of omission and commission will become evident during the processing of these data. The institutional instruction representative and the institutional study coordinator will, therefore, be well advised to keep a readily available record of the names of the persons who prepared, reviewed, and approved the Forms L-1 for each department, if only to simplify and expedite the process of settling questions which may arise during the tabulating operations.)

The individual items on Form L-1 are further defined and described below: (Entries will be made in items A through F on every page.)

ITEM A. SEMESTER or QUARTER: The inapplicable word (Semester or Quarter) will be crossed out and the appropriate entry (e.g., Fall 1954) will be made on the line at the left of the enclosed block A.

ITEM B. INSTITUTION: The accepted "short form" of the institution's name will be entered on the line at the left of the enclosed block B.

ITEM C. CAMPUS or BRANCH: The distinguishing part of the name of the geographically-separate major unit of the institution will be entered on the line at the left of the enclosed block C.

ITEM D. COLLEGE or SCHOOL: The key word(s) of the name of the college or school (e.g., Arts and Science, Engineering) by which the instruction was offered will be entered on the line at the left of the enclosed block D.

ITEM E. DEPARTMENT (AND DIVISION THEREOF): The key word(s) of the name of the department (e.g., English, Mathematics) by which the instruction was offered will be entered on the line at the left of the enclosed block E. If other names must also be used in conjunction with the numerical designations of courses to avoid duplication of course numbers within the department (e.g., Geology 120 and Mineralogy 120 in the Department of Geological Sciences), then the name identifying the division of the department will be entered in parentheses following the name of the department. A separate Form L-1 will be prepared for each such division of the department. (Note that no parenthetical entry is necessary if there is no duplication of numerical course designations within the department.)

ITEM F. SUBJECT FIELD: The 4-digit code number and standard abbreviation of the specific subject field (subject-matter area) in which instruction was offered will be entered on the line at the left of the enclosed block F in terms of the finest numbered subdivision listed in the appropriate portion of the Study's "Standard Classification of Subject Fields, Services, and Related Accounts." (Subject fields 1000 through 3900 are based on a standard classification recently developed by the National Science Foundation.)

If a department offered instruction in more than one specific subject field, the department's courses will be appropriately classified and will be reported on separate Forms L-1, e.g., the individual physical sciences, the individual social sciences, the individual foreign languages. Survey courses and other single courses which cut across or cover more than one specific subject field will be reported under the code number and abbreviation of the most appropriate group of subject fields, e.g., 2000--MPE SCI, 3000--SOCIAL SCI, 4000--HUMANITIES, 4400--FOREIGN LANG.

It will be noted that several listings in the "Standard Classification" include parenthetical cross-references. In each such case, the courses concerned will be classified in the subject field representing the major emphasis of the instruction. In the absence of any other criterion, it will be assumed that the major emphasis is represented by the institution's administrative organization; e.g., if there is no better basis for the decision, biochemistry courses offered by a biological science department will be classified as 1200--BIOMED SCI, and biochemistry courses offered by a chemistry department will be classified as 2200--CHEMISTRY.

All instruction offered by departments of colleges and schools of agriculture usually will be classified as Agriculture--General (1110--AGRIC GEN), except that forestry and veterinary medicine and science will be segregated (as 1181--FORESTRY and 1182--VET MEDSCI, respectively). An exception will, however, be made in the case of an instructional program which serves primarily as that of a general academic department, even though the department is administratively within the college or school of agriculture, as in the case of a botany or zoology department which is the only such department on a campus with a liberal arts college that is served to a significant degree by said department. Irrespective of administrative organization, such professional programs as home economics and landscape architecture (see subject fields 5400 and 5907) will be separately classified and reported, even though they are administratively within a college or school of agriculture.

In colleges and schools of engineering that are organized in the traditional departments (or other subdivisions) of civil engineering, electrical engineering, mechanical engineering, etc., the instructional programs will be classified and reported strictly in accordance with the specific subject fields in the 2800-group of the Study's "Standard Classification". (If architectural engineering courses are offered by a college or school of architecture, they will not be segregated. Chemical engineering courses will, however, be segregated and separately reported, whether they are part of an engineering program or part of a chemistry program.) In all cases, engineering courses that are classifiable as "general engineering" will be reported under the broad classification, Engineering Sciences (2700--ENGIN SCI).

As noted earlier in these instructions, certain medical school instructional programs in the basic sciences (anatomy, biochemistry, physiology, etc.) will be reported on Form L-1. (See page 3.) Such courses will be classified as subject field 1200--BIOMED SCI, not 5720--MEDICINE.

COLUMN 1. COURSE NUMBER: The course number (maximum of three digits, plus not more than one alphabetic suffix) will be entered in this column. Courses identified by a letter only, e.g., Mathematics A, will be so listed on Form L-1. Courses not ordinarily identified by either a number or a letter, including informally-arranged individual study and research by students for whose supervision an allocation of faculty time will be reported on Form L-2, must be assigned a course number for the purposes of this study and will be so reported on Form L-1. (Course numbers listed on Form L-1 but not appearing in the institution's printed catalog of courses will be entered *in parentheses* in column 1 of Form L-1, and appropriate annotations will be made in the printed catalog transmitted to the Central Study Staff with the completed Forms L-1. The institutional representative and coordinator should keep a record of all such special listings made on Form L-1 for reference when Forms L-2 are received by the institution with those course numbers reproduced thereon.)

As prescribed earlier in these instructions (page 2), a single listing accounting for all students in each class will be made on Form L-1 in terms of *one* course number in those cases in which various sub-groups of students received credit under different course numbers--even course numbers of different departments--*unless* separate listings are required to reflect essentially different levels of instruction within the class. (Separate listings will affect class-size and teaching-load measurements, and must therefore be made with discretion. They must, in fact, be guarded against, for a clerk will compile them unwittingly from most formal records of course enrollments.)

COLUMNS 2, 3, 4. COURSE LEVEL--LOWER DIVISION (Freshman-Sophomore), UPPER DIVISION (Junior-Senior), GRADUATE DIVISION: The level of each course, i.e., the level of *instruction*, will be indicated by entering an X in one (*only one*) of these three columns. Courses for students with deficient high-school records, as in English and mathematics, will be classified as lower division. Fifth-year courses which are part of a program leading to a bachelor's degree will be classified as upper division; all other courses beyond the fourth year will be classified as graduate division.

Ordinarily, the classification of each course by level will be made in accordance with the level at which the instruction was given or aimed, as indicated by the institution's pattern of course numbering, irrespective of the enrolled students' level of registration in the institution. In the case, however, of those institutions which formally designate certain courses as "undergraduate-graduate", i.e., courses specifically designated in catalogs as offered for both advanced undergraduate and graduate students, each such course will be classified for the purposes of this study, and will be reported on Form L-1, on the basis of the level of institutional registration of the majority of the students enrolled in the course for the semester or quarter concerned.

COLUMN 5. CREDIT VALUE: The figure indicating the credit-value of each course (semester or quarter credit-hours) will be entered in this column. In the case of a course in which the individual students earned different numbers of credit-hours, the entry will be the single figure representing the average number of credit-hours, i.e., the result of dividing the total number of student-credit-hours by the number of students. In all cases involving fractional credit-hours, the entry will express the credit-value in decimals to the nearest tenth (0.1); but all whole-number values may be listed without the decimal-point and zero.

As prescribed earlier in these instructions (page 2), non-credit and zero-credit courses, as well as informal arrangements of individual study and research (see also instructions for column 1), must be assigned an equivalent credit-value for the purposes of this study, and will be so reported on Form L-1. Such credit-values will be entered in column 5 of Form L-1 in parentheses.

COLUMN 6. COURSE ENROLLMENT: The total enrollment in the course, will be entered in this column. This figure will be the enrollment after all adjustments occurring on the last day of withdrawal without penalty have been made. Only formally enrolled students will be included. Auditors will be excluded, unless they were included in the institution's official enrollment figures for the course.

COLUMNS 7, 8, 9, 10. TYPE OF INSTRUCTION--ORGANIZED CLASSES (subdivided into NON-LABORATORY CLASSES, which are further subdivided into PRIMARY and SECONDARY SECTIONS, and LABORATORY CLASSES) and INDIVIDUAL STUDY AND RESEARCH: Irrespective of the type of physical facilities that unusual circumstances may have required to be used in the semester or quarter concerned, the type(s) of instruction given in the course will be indicated by entering an X in one column on each of one or more lines.

NON-LABORATORY ORGANIZED CLASSES (columns 7 and 8) include lecture, quiz, recitation, discussion, seminar, and lecture-demonstration classes, i.e., all classes for which lecture halls (including lecture-demonstration rooms), general classrooms, and/or seminar rooms are suitable. Such classes generally are also characterized by the fact that the students earn approximately, if not exactly, one credit-hour for each weekly class-hour. If the non-laboratory instruction was given in only one section, or in only one set of similar sections, the entry (X) will be made in column 7. (See courses number 1A and 2A on the sample Forms L-1.) If there were two types of non-laboratory section, e.g., large lecture sections and small discussion sections, the type organized in the larger groups will be classified as PRIMARY (column 7), and the type organized in the smaller groups will be classified on separate lines as SECONDARY (column 8). (See course number 4A on the sample Forms L-1.) In no case will a course be classified by an entry in column 8 only.

LABORATORY ORGANIZED CLASSES (column 9) include all classes requiring special- or limited-purpose facilities, including instructional shops, drafting rooms, accounting and statistics computing rooms, art and music studios, and the gymnasium and armory facilities in which physical education and military science "activities" classes are held, but excluding lecture-demonstration and seminar rooms. Such classes generally are also characterized by the fact that the students earn considerably less than one credit-hour (usually one-third to one-half credit-hour) for each weekly class-hour. Whether or not the course also included non-laboratory sections, the laboratory sections will be identified by an X in column 9. (See courses number 105A and 172A through 180 on the sample Forms L-1. Note that for a course which had lecture sections, discussion sections, and laboratory sections, the entries in columns 7, 8, and 9 would be a combination of those illustrated by courses number 4A and 105A.)

It is essential that the report on Form L-1 show a clear segregation into non-laboratory and laboratory instruction in those instances in which the institution assigned a single course number and may even have had no formal organization of the students into more than one class or section, but in which another institution--or even another department in the same institution--might well have organized and will therefore be reporting the equivalent instruction as separate classes and even as separate courses. Ordinarily, however, arrangements of the nature of informal discussion sessions within the class-period and under the same instructor of a laboratory section will not be segregated on Form L-1. (Generally, the appropriateness of reporting more than one type of instruction in a course is indicated by the fact that the number of credit-hours per total weekly class-hour reflected a combination of the institution's normal patterns of that relationship in non-laboratory and laboratory classes, respectively. For example, a course might be listed somewhat nominally in the institution's formal records as a laboratory course. Its credit-value might, however, be greater than is normally assigned for the number of hours the class met each week, and this relationship might represent the fact that one or two of those weekly class-hours are reasonably classifiable as non-laboratory instruction. It should, however, be kept in mind that, in the analysis of these data as they pertain to space utilization, it will be assumed that all instruction reported as "non-laboratory" did not require that the sections concerned be scheduled in laboratories.)

INDIVIDUAL STUDY AND RESEARCH (column 10) includes all instruction other than that given in organized classes, including individual instruction and practice in music, and practice teaching and other in-service training programs in which the students worked more-or-less individually at off-campus locations. (On the sample Forms L-1, courses number 172A and 174A are listed as organized classes at off-campus locations. If, however, the students had worked as individuals--either on the same schedule or at different times--then the X would be entered in column 10, and specific entries in columns 11 through 20 would not be required, unless the listing of an instructor's name and initials in columns 14 and 15 would correctly indicate that the course should subsequently be made to appear on Form L-2 under his name alone.)

COLUMN 11. CLASS-HOURS PER WEEK: The separate line started for each type of class in each course by an entry in column 7, 8, or 9 will be continued by entering in column 11 the weekly number of scheduled class-hours for each such section. The number of class-hours per week will be stated in terms of the conventional measurement of "academic hours", i.e., in terms of the number of periods that are individually shorter than 60 minutes by the length of the class-change interval. In the case of, for example, a "3-hour" lecture class that was held in two afternoon meetings or one evening meeting, the entry in column 11 will be made in terms of the "normal" measurement, i.e., 3. (See course number 165 on the sample Forms L-1 and note that the entry in column 11 represents the "normal" three 50-minute "hours"--exactly the same total class-time as in the one 150-minute meeting.)

In the case of individual instruction (an X in column 10), no entry in column 11 or any subsequent column is required, except as noted below for columns 14 and 15.

COLUMN 12. SECTION NUMBER: Ordinarily, each section will be identified by entering in this column whatever alphabetic and/or numeric designation the institution used in its own records, except that the entry cannot exceed four characters. Every section of a multi-section course will, however, be uniquely identified, i.e., there must be no duplication in the designations of a given type of sections of a given course. The one section of a single-section course will be reported as number 1.

As mentioned earlier in these instructions (page 1), it will sometimes be necessary to report as separate sections the sub-groups of a group of students listed in the institution's formal records as a single section. The measurements of space utilization will include tabulations of specific classes and numbers of students scheduled each hour in each room. Each group of students scheduled in a separate room must, therefore, be reported as a separate section. (See courses number 176A and 178A on the sample Forms L-1. Note that both cases might be represented in the institution's formal records by single listings of 23-student sections, each scheduled six hours per week, and each with a listing of two rooms but with no indication of the manner in which the 23 students used the two rooms. On the sample Forms L-1, the listing of course number 176A illustrates the proper method of reporting the fact that both rooms were used all the scheduled hours, and that the students were divided approximately equally between the rooms. The listing of course number 178A illustrates the proper method of reporting the fact that each room was used approximately half the scheduled hours and that the students remained together as a single group.)

It will also be necessary (for the subsequent allocation of staff time and expense) to report as separate sections, even within a single room, any sub-groups that had separate instructors, as in the case of an engineering laboratory section that was divided into sub-sections, parties, or teams, each with its own instructor.

COLUMN 13. SECTION ENROLLMENT: The separate line started for each section by an entry in column 12 will be continued by entering the section enrollment in column 13. The section enrollments will be reported on the same basis as the course enrollments, and the sum of the section enrollments reported for two or more sections of a given type must equal the course enrollment reported in column 6. The figure reported in column 6 for a single-section course will be repeated in column 13.

COLUMNS 14 & 15. INSTRUCTOR'S SURNAME AND INITIALS: The surname of the instructor (direct teacher) of each section will be entered in column 14, and his or her initials (first two if more than two) will be entered in column 15. Two or more names will be listed for a section if (and only if) the two or more instructors "took turns" in, or otherwise literally shared, the duties of direct teaching. (See course number 165 on the sample Forms L-1, and note that an X is entered in column 16 after each name.) Such duties as the supervision of a group of teaching assistants who were the direct teachers of discussion or laboratory sections will not be reported on Form L-1. (An estimate of the faculty member's time spent on such supervisory duties will, however, be included in the figures subsequently reported on Form L-2 as the percent of time spent by that faculty member on the course concerned.)

In the case of individual instruction, including the supervision of students engaged in individual study and research, the listing of an instructor's name on Form L-1 will cause the course number and related data to be printed on Form L-2 under the reported instructor's name before the Forms L-2 are distributed to the institutions for further entries. Therefore, unless the one instructor is the only one whose time should be allocated (on Form L-2) to the course concerned, entries should not be made in columns 14 and 15 of Form L-1 for individual-instruction courses. (If, however, the time of only one instructor is properly allocable to a course classified as individual instruction, and if the institution wishes a listing of that course to be printed under that instructor's name on Form L-2, then the name and initials may be entered in columns 14 and 15 of Form L-1.)

COLUMN 16. SHARED INSTRUCTION: (See above instructions for columns 14 and 15.)

COLUMN 17. DAY: The individual days on which each section was scheduled will be entered in this column, abbreviated as indicated in the column-heading. (List each day; do not report "daily" or "M-F".)

Note that columns 17 through 20 are to be filled in for the fall semester or quarter only.

COLUMN 18. HOUR: The hours at which each section was scheduled on the days listed in column 17 will be entered in column 18 in terms of the starting time of each "one-hour" period. Institutions in which classes normally started a few (up to 15) minutes before the hour will identify each "one-hour" period in terms of its whole-number designation, e.g., starting times from 7:45 to 8:00 a.m. will be reported as "8". Normal starting times less than 45 minutes after the hour will be reported with the minutes omitted, e.g., 8:00 to 8:44 a.m. will be reported as "8".

Ordinarily, the individual hours will be listed, e.g., 1, 2, 3 (not 1-4). (See courses number 1A through 105A on the sample Forms L-1.) However, schedules that differ from the institution's normal pattern will be reported in terms of starting and ending times. (See course number 165 on the sample Forms L-1.) In all cases, the hours 6 p.m. and later will be specifically designated PM. No other AM or PM designations will be included in column 18 (unless some institution held classes in the early hours of the morning).

On the sample Forms L-1, note courses number 178A and 180 as illustrations of proper listings in columns 17 through 20 for different rooms or hours on different days.

COLUMNS 19 & 20. BUILDING and ROOM NO.: As indicated by the notes in the column-headings, the abbreviations of building names, and the room numbers, must be reported in these columns in exact typographical conformity with the corresponding abbreviations and numbers reported in the physical inventory on Form P-1. The persons responsible for completing Form L-1 will, therefore, secure their instructions concerning the listing of building abbreviations and room numbers from the person responsible for completing Form P-1; and the institutional study coordinator will insure that all persons concerned follow rigidly the instructions for Form P-1 in this respect.

Because columns 19 and 20 will provide data for the building space utilization part of the study only, parenthetical entries in general terms are all that are required for classes that were conducted outdoors or in any off-campus location. (See courses number 172A and 174A on the sample Forms L-1. "Athletic Fields" or "City Tennis Courts" could, for example, be similarly reported parenthetically for certain physical education classes; or "Drill Field" for certain R.O.T.C. sessions.)

NOTE: The Central Study Staff realizes that some institutions customarily record class schedules and locations in a sequence of items different from that of columns 17 through 20. The order of these columns is, however, that used by the majority of the institutions participating in this Study.

CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

SAMPLE

FORM L-1

SEMESTER: Fall 1954 A 1
INSTITUTION: Populous State B 2
CAMPUS or BRANCH: Campopulous C 3
COLLEGE or SCHOOL: Arts & Science D 4 5
DEPT. (AND DIVISION THEREOF): Cool. Sci. (Geology) E 6 8
SUBJECT FIELD: 2300 - EARTH SCI F 9 12

COURSE — IN COLUMNS 2-4, MARK (X) ONLY ONE LEVEL FOR EACH COURSE. IN COLUMNS 7-10, MARK (X) A SEPARATE LINE FOR EACH TYPE OF INSTRUCTION										EACH CLASS OR SECTION			INSTRUCTOR OF EACH CLASS OR SECTION			SCHEDULE OF EACH CLASS OR SECTION FALL SEMESTER OR QUARTER ONLY. (OMIT OTHER SESSIONS)			
COURSE NO. MAX. = 3 DIGITS PLUS 1 SUFFIX	COURSE LEVEL			CREDIT VALUE FRACTIONS DECIMAL TO NEAREST 0.1	COURSE ENROLLMENT FORMAL ENROLLEES ONLY	TYPE OF INSTRUCTION				CLASS HOURS PER WEEK	SECTION NO. MAX. = 4 DIGITS AND/OR LETTERS	SECTION ENROLLMENT	SURNAME	INITIALS MAX. = 2	SHARED INSTRUCTION (X)	DAY ABBREVIATE M TU W TH F S	HOUR LIST EACH HOUR, E.G., 1, 2, 3 (NOT 1-4), EXCEPT AS IN 8-9:30 & 9:30-10. SHOW 8:1 FOR 8P.M. & LATER	BUILDING ABBREVIATE EXACTLY AS ON FORMS P-1 AND P-2.	ROOM NO. LIST EXACTLY AS ON FORM P-1.
	LOWER DIV.	UPPER DIV.	GRAD. DIV.			ORGANIZED CLASSES			INDIVIDUAL										
						NON-LAB		LAB											
						LEC	DISC												
13-16	17	17	17	18-20	21-24	25	25	25	25	26-28	29-32	33-36	37-48	49-50	51	52-57	58-63	64-71	72-77
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1A	x			3	53	x				3	1	53	Jones	A B		M W F	10	Mech	9
2A	x			3	90	x				3	1	47	Black	B B		M W F	3	DH	212
											2	43	Brown	C C		Tu Th S	10	DH	136
4A	x			3	100	x				2	1	51	White	W W		M W F	9	Mech	17
											2	49	White	W W		Tu Th S	9	BH	109
							x			1	a	25	Blue	D D		M	2	DH	212
											b	26	Blue	D D		Tu	2	BH	136
											c	25	Green	H H		Th	2	Eng	26
											d	24	Green	H H		Th	3	DH	136
105A		x		4	60	x				2	1	29	Jones	A B		Tu Th	8	LH	102
											2	31	White	W W		M W	8	LH	102
								x		6	1	21	Grey	E E		Tu Th	1,2,3	LH	107
											2	20	Green	H H		M W	1,2,3	LH	107
											3	19	Grey	E E		Tu Th	9,10,11	LH	107

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CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

SAMPLE

FORM L-

SEMESTER: Fall 1954 A 1

INSTITUTION: Populous State B 2

CAMPUS or BRANCH: Campopulous C 3

COLLEGE or SCHOOL: Arts & Science D 4

DEPT. (AND DIVISION THEREOF): Geol. Sci. (Geology) E 5

SUBJECT FIELD: 2300 - EARTH SCI F 6

COURSE (IN COLUMNS 2-4, MARK (X) ONLY ONE LEVEL FOR EACH COURSE. IN COLUMNS 7-10, MARK (X) A SEPARATE LINE FOR EACH TYPE OF INSTRUCTION)										EACH CLASS OR SECTION			INSTRUCTOR OF EACH CLASS OR SECTION			SCHEDULE OF EACH CLASS OR SECTION FALL SEMESTER OR QUARTER ONLY. (OMIT OTHER SESSIONS)			
COURSE NO. (MAX. 3 DIGITS PLUS 1 SUFFIX)	COURSE LEVEL			CREDIT VALUE (FRACTIONS AS DECIMALS TO NEAREST 0.1)	COURSE ENROLLMENT (FORMAL ENROLLEES ONLY)	TYPE OF INSTRUCTION				CLASS HOURS PER WEEK	SECTION NO. (MAX. 4 DIGITS AND/OR LETTERS)	SECTION ENROLLMENT	SURNAME	INITIALS MAX. 2	SHARED INSTRUCTION (X)	DAY ABBREVIATE M TU W TH F S	HOUR LIST EACH HOUR, E.G., 1,2,3 (NOT 1-4), EXCEPT AS IN 8-9:30 & 9:30-10. SHOW PM FOR 6PM & LATER HRS.	BUILDING ABBREVIATE EXACTLY AS ON FORMS P-1 AND P-2.	ROOM NO. LIST EXACTLY AS ON FORM P-1.
	LOWER DIV.	UPPER DIV.	GRAD. DIV.			ORGANIZED CLASSES NON-LAB		LAB	INDIVIDUAL										
[illegible]	17	17	17	18-20	21-24	25	25	25	25	26-28	29-32	33-36	37-48	49-50	51	52-57	58-65	66-71	72-77
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
165		x		3	12	x				3	1	12	(Jones (Brown	A B C C	x x	) Tu	7:30 - 10 PM	Lib	12[illegible]
172A		x		2	14			x		8	1	14	Black	B B		Tu Th	1,2,3,4	(Field Trip)	
174A		x		3	17			x		8	1	17	(City Museum Staff)			Tu Th	1,2,3,4	(City Museum)	
176A		x		2	23			x		6	1	(12	White	W W		M W	1,2,3	Chem	B-101
												(11	Jones	A B		M W	1,2,3	Chem	B-103
17[illegible]A		x		2	23			x		6	1	23	Brown	C C		(M	1,2,3	Chem	2105
																(W	1,2,3	Chem	2107
[illegible]		x		2	12			x		6	1	12	Blue	D D		(W	1,2,3	Chem	2109
																(S	9,10,11	Chem	210[illegible]
205			x	3	17	x				4	1	17	White	W W		Tu Th	3,4	Lib	12[illegible]
293			x	3.2	7				x	(Individual research under various staff members)							—	—	—

PAGE 2 OF 2 PAGES

CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

INSTRUCTIONS FOR THE COMPLETION OF FORM L-2

INTRODUCTION

Before Form L-2 can be completed, an institution must have (1) completed and returned Forms L-1 to the Central Study Office; (2) completed Forms A-1; and (3) completed lines 3, 4, 5, and 6 of Forms D-1.

Form L-2 will be completed for each faculty member who taught in or was paid by an instructional department (other than extension, summer session, and those departments or schools of dentistry, medicine, nursing, pharmacy, and public health that were not reported on Forms L-1).

The distribution of time of each faculty member will be reported by percentages on Form L-2. These percentage allocations will be made to teaching work and any of sixteen standard non-teaching work classifications. Form L-2 will also accumulate the individual's actual salary expenditure data.

Form L-2 is divided into three sections. Section A is used to report the individual's time spent in teaching. Section B is used to report the individual's time spent in non-teaching activities. Section C is used to report the individual's salary as it was actually disbursed within the institution's organizational structure.

A Form L-2 has been mechanically printed by IBM for each individual who was reported on a Form L-1 as having been responsible for the teaching of a class.

Forms L-2 have also been printed listing those classes in each instructional department that were not identified with an instructor when the classes were reported on Forms L-1. These Forms L-2 not identified by instructor will be set aside until Step Eight.

Three sets of Forms L-2 have been sent to each institution. The carbon copies will be used as worksheet and institutional file copies. The original will be returned to the Central Study Office. Included with the Forms L-2 is an IBM alphabetical list of the individuals for whom Forms L-2 have been mechanically printed.

The completion of an institution's Forms L-2 is divided into the following ten steps, each of which is described in detail in these instructions for the completion of Forms L-2.

Step One - Correction of misspelled names on the IBM alphabetical list and Forms L-2.

Step Two - Developing the IBM alphabetical list to include all individuals who must appear on a Form L-2.

Step Three - Entry of the name of the college or school and department in the heading of each Form L-2.

Step Four - Entry of the salary data in section C of Forms L-2.

Step Five - Transfer of the salary data in section C of Forms L-2 to the IBM alphabetical list.

Step Six - Preparation of the Instructional Department Analysis.

Step Seven - Completion of Forms D-1.

Step Eight - Scheduling meetings with department administrators; transfer of class data from Forms L-2 not identified by instructor; entry on Forms L-2 of rank, age, sex, administrative title, and total percentage of full-time to the institution.

Step Nine - Description of columns and lines in section A and section B of Form L-2.

Step Ten - Distribution of total percentage of full-time among teaching activities in section A and non-teaching activities in section B of Form L-2.

STEP ONE

CORRECTION OF MISSPELLED NAMES ON THE IBM ALPHABETICAL LIST AND FORMS L-2

When Forms L-1 were completed by the institution, not all repeated faculty names were spelled correctly with the correct initials in each instance. For example, Jones, E. H., may have been listed one time as Jones, E. H., and in another entry as Jones, E. In this case two Forms L-2 have been printed for Jones and he is listed twice on the IBM alphabetical list. As a second example, McDonald, J. A., may have been listed one time as McDonald, J. A., and in a second entry as MacDonald, J. A. In this case two Forms L-2 and two entries on the IBM alphabetical list have been made.

The first step is, therefore, the correction of cases where, due to incorrect spelling or initials, an individual has been treated as two or more individuals on Forms L-2 and on the IBM alphabetical list. The Forms L-2 and the IBM alphabetical list received by the institution are in the same alphabetical order and can be corrected simultaneously. This will be accomplished as follows: If the same individual is listed more than once on the IBM alphabetical list, the first entry will be corrected for spelling and initials and all subsequent entries for this individual will be crossed out in red pencil in a manner leaving the original entry still legible. At the same time, the Forms L-2 printed for this individual will be stapled together with the Form L-2 placed first which bears the greatest number of class entries in section A. This first Form L-2 will be corrected for any misspelling of the individual's name or initials to agree with the corrected IBM alphabetical list. Next, all entries in section A of the remaining Forms L-2 for this individual will be crossed out using red pencil (leaving the original entry still legible) and transferred to the appropriate columns on the first Form L-2. Care must be taken to transfer the entries exactly as originally listed.

In most institutions Step One will be the responsibility of the Institutional Study Coordinator.

STEP TWO

DEVELOPING THE IBM ALPHABETICAL LIST TO INCLUDE ALL INDIVIDUALS WHO MUST APPEAR ON A FORM L-2

The Forms L-2 and the IBM alphabetical list do not include all faculty members and student assistants, or their equivalent, for whom a detailed reporting of time allocation and salary expense is required on a Form L-2.

The second step, therefore, will include (1) the identification of the remaining faculty members and student assistants, or their equivalent, for whom a detailed reporting of time allocation and salary expense is required; (2) the insertion of their names in the IBM alphabetical list; and (3) the preparation of Forms L-2 for these individuals. This will be accomplished as follows:

A. Each instructional department will be requested to submit a complete list of all individuals in the department who fulfilled any of the following requirements during the academic year 1954-1955.

  1. All individuals who had academic rank and were paid wholly or in part by the department, whether or not they performed work in the department. Included will be all individuals on sabbatical leave with pay.

  2. All individuals who had academic rank and performed work in the department, whether or not they were paid by the department.
     NOTE: In (1) and (2) above, academic rank will include Professor, Associate Professor, Assistant Professor, Instructor, and any equivalent title such as Lecturer or Associate.

  3. All student assistants or their equivalent who had direct teaching assignments such as discussion section assignments, quiz section assignments, and laboratory section assignments. These student assistants or equivalent will be reported even though their teaching assignment represented only part of their responsibility.

These listings prepared by the departments should include all individuals to be reported on a Form L-2.

B. The departmental lists will be checked against the IBM alphabetical list and any name included on the departmental lists, but not shown on the IBM alphabetical list, will be inserted alphabetically on the IBM list. It may be found that occasionally names appear on the IBM alphabetical list that do not appear on any departmental list. In most cases, this is an indication that some department has unintentionally omitted the name from its list. All such names will be left on the IBM alphabetical list. At the same time a name is inserted on the IBM alphabetical list, a Form L-2 will be prepared for that individual as explained in the next paragraph (C) below.

C. The institution, the campus, and the individual's name will be typed in the heading of Form L-2. Three copies of Form L-2 will be typed for this individual and one copy will be inserted alphabetically into each of the three sets received by the institution. Each of these Forms L-2 will be given a page number by using the page number of the Form L-2 immediately preceding it, with the addition of an alphabetic suffix.

Step Two will ordinarily be the responsibility of the Institutional Study Coordinator.

STEP THREE

ENTRY OF THE NAME OF THE COLLEGE OR SCHOOL AND DEPARTMENT IN THE HEADING OF EACH FORM L-2

The third step will be the insertion of the names of the college or school and the department in the heading of each Form L-2. This will be accomplished as follows:

A. On the blank line for College or School will be entered the key word(s) of the name of the college or school (e.g., Arts and Sciences, Law) to which the individual was assigned for purposes of administration. The entries used in most instances will be obtained from column 2 of the institution's Master List of Department Code Numbers and Standard Classifications. For those individuals whose primary assignment was outside the instructional colleges or schools, the name of the administrative unit to which he was primarily assigned will be entered here. For example, if the comptroller of an institution teaches a course in the business school, the title, Comptroller's Office, will be used. For those individuals whose primary assignment was in a campus-wide college or school administrative office not included in the Master List of Department Code Numbers and Standard Classifications, the title entered here will be that of the college or school administrative office. An example of this would be a dean of a campus-wide graduate school.

B. On the blank line for Department will be entered the key word(s) of the name of the department (e.g., English, Mathematics) to which the individual was assigned for purposes of administration. The entries used will in most instances be obtained from column 3 of the institution's Master List of Department Code Numbers and Standard Classifications. As in paragraph A, when an individual's assignment for purposes of administration was outside the instructional colleges or schools, the name of the administrative unit to which he was primarily assigned will be entered here. This departmental designation will be used to identify the department and the department administrator to whom a Form L-2 must be sent for completion of the time allocation.

Step Three will ordinarily be the responsibility of the Institutional Study Coordinator.

STEP FOUR

ENTRY OF THE SALARY DATA IN SECTION C OF FORMS L-2

The fourth step will be the entry of actual salary expenditures in section C of each Form L-2. The salary paid to each individual for whom a Form L-2 has been prepared will be entered in the detail requested below. The salary figures entered for the individual will constitute the total paid by the institution, including agricultural extension, but excluding that paid by the extension division and the summer session, except as directed in paragraph B below.

A. SECTION C, COLUMNS 2 AND 3. STANDARD CLASSIFICATION OF SUBJECT FIELDS, SERVICES, AND RELATED ACCOUNTS: The information requested in columns 2 and 3 indicates the detail in which the source of the salary will be reported. Column 2, lines 2, 3, and 4, will be used to insert the title of the instructional department(s) representing the source of funds included in the individual's total salary. When the same title is contained on the Master List for a college and for a department, entries pertaining to such a college or department in column 2, lines 2, 3, or 4 will be followed by a parenthetical suffix differentiating between the two. Examples would be Agriculture (Office of the Dean) and Agriculture (Department). With two exceptions, this department title will be the title contained in column 3 of the institution's Master List of Department Code Numbers and Standard Classifications. The first exception to the use of the title contained in column 3 occurs when the individual is paid by the administrative office of a college or school listed in column 2 of the Master List of Department Code Numbers and Standard Classifications (e.g., Dean of Engineering). In this case the title shown in column 2 of the Master List (e.g., Engineering) will be entered here. The second exception occurs when the individual is paid by a campus-wide college or school administrative office or one of the medical professions not included in the Master List of Department Code Numbers and Standard Classifications (e.g., Dean of Graduate School or Medicine). In these cases the title entered will be the actual title of the office or account (e.g., Graduate School or Medicine). Preceding the title in column 2 will be entered in parenthesis the department code number when it is contained in column 1 of the Master List of Department Code Numbers and Standard Classifications. Column 3 will be used to insert the proper standard classification code number. For lines 2, 3, and 4, the standard classification code numbers will be obtained from column 5 of the Master List of Department Code Numbers and Standard Classifications. If the standard classification code is not in the Master List, as in the case of a graduate school or school of medicine, it will be selected from the Summary List of Standard Classifications. For lines 5, 6, 8, 10, 11, 12, 13, and 14, the standard classification code number will be selected from the Summary List of Standard Classifications. In all cases when column 3 includes empty spaces for completion of the code number the choice made will be based on the detailed account from which the salary expense was paid.

Caution must be exercised to insure that the salary identified by the standard classification code number in column 3 is included in the expenditure reported in column 10 of Form A-1 under this same standard classification code number. This will be accomplished as follows: When entries are made in column 3, the Forms A-1 will be examined to insure that any transfers on Form A-1, within the standard classification in question, do not affect the salary of the individual for whom the Form L-2 is being prepared. If the salary of the individual for whom the Form L-2 is being prepared is included in the transfer reported on Form A-1, it will be reported on Form L-2 in the standard classification to which the transfer was effected.

B. SECTION C, COLUMNS 4, 5, AND 6. SALARY EXPENDITURES: In these columns will be entered the institutional salary of the individual which was included in the institution's expenditures for the fiscal year 1954-1955.

With one exception, no salary amounts will be entered which were paid out of either the summer session or extension accounts as reported on Form A-1 under standard classification code numbers 7910 and 7700, respectively. This one exception is the case of an individual whose entire salary was paid out of either the summer session account (standard classification 7910) or extension account (standard classification 7700), but for whom a Form L-2 was prepared because he performed work in an instructional department during the academic year. In all such cases the Institutional Study Coordinator will, in cooperation with the department administrator and the extension or summer session director, determine that portion of the individual's salary representing his work in the department and report it on Form L-2 as having been paid by the department in which the work was performed. This department into which it is transferred will be identified in columns 2 and 3, lines 2, 3, or 4; and the salary amount will be entered in columns 4 and 6. At the same time the percentage of full-time to the department, corresponding to this salary amount, will be entered in section B, line 20, columns 5, 6, and/or 7. A list of all such individuals will be titled "Individuals Paid Wholly by Summer Session or Extension" and submitted to the Central Study Office when Forms L-2 are returned.

All individuals hired on an academic-year basis (nine or ten months) will have their academic-year salary entered in columns 4 and 6. None of their academic-year salary will be allocated to the summer period, even though it was paid over a twelve-month period. One exception to this may occur in an institution on the quarter system when an individual hired for the academic year takes his vacation during a quarter of the academic year and works during the summer quarter. If this salary division between the academic year and summer quarter has not been made in the institution's accounts for the fiscal year 1954-1955, the institution will enter two-thirds (2/3) of his academic-year salary in column 4 for the academic year, one-third (1/3) of his academic-year salary in column 5 for the summer period, and the total in column 6.

All individuals who were employed on a fiscal-year basis (eleven or twelve months) will, if the contract did not stipulate the portion paid for summer work but rather stated only a fiscal-year salary, have their fiscal-year salary divided by applying the percentages shown in the following table. The amount for the academic year will be entered in column 4; the amount for the summer period will be entered in column 5; and the total will be entered in column 6.

Institution	Academic Year %	Summer Period %
California		
Berkeley	83.0	17.0
Davis	82.4	17.6
Los Angeles	83.6	16.4
Riverside	83.9	16.1
Santa Barbara	83.3	16.7

(Continued on next page)

Institution	Academic Year %	Summer Period %
Indiana	81.8	18.2
Iowa	80.0	20.0
Michigan State	80.9	19.1
Minnesota	79.1	20.9
Penn State	81.2	18.8
Purdue	78.5	21.5
Vanderbilt	76.7	23.3
Wabash	80.6	19.4

The percentages shown above were arrived at by the application of the following formulae:

$$\frac{\text{Days in academic year}}{\text{Days in work year}} \times 100 = \text{Percentage of fiscal-year salary to be charged to the academic year}$$

$$\frac{\text{Days in summer period}}{\text{Days in work year}} \times 100 = \text{Percentage of fiscal-year salary to be charged to the summer period}$$

Days in academic year = The day on which fall classes began, plus 7 days, through the end of final examinations or commencement, whichever occurred later.

Days in work year = 365-day year, minus 30-day vacation = 335 days.

Days in summer period = Days in work year, minus days in academic year.

Step Four is ordinarily the responsibility of the business office. However, the Institutional Study Coordinator may have to give help in identifying the individuals referred to in paragraph B above.

STEP FIVE

TRANSFER OF THE SALARY DATA IN SECTION C OF FORMS L-2 TO THE IBM ALPHABETICAL LIST

The fifth step will be the transfer of salary data entered in columns 2 and 6 of section C, Form L-2, to the IBM alphabetical list. This will be accomplished as follows: Immediately after each name on the IBM list will be entered the total institution salary shown in column 6, line 19, section C. To the right of the total salary (on the same line) will be entered the instructional department names and standard classification titles appearing in column 2 which represent the source from which the salary was paid. These entries will be limited to those contained in column 2, section C, of Form L-2. To the right of each instructional department name and standard classification title will be entered the salary shown in column 6, section C, paid from the corresponding account. The sum of all separately listed salary amounts must equal the previously entered total institution salary for the individual.

Step Five will ordinarily be the responsibility of the business office.

STEP SIX

PREPARATION OF THE INSTRUCTIONAL DEPARTMENT ANALYSIS

The sixth step will consist of the following two operations:

A. The money amounts on the IBM alphabetical list and those on all Forms L-2 will be totalled and compared to insure accuracy.

B. The money amounts on the IBM alphabetical list will be analyzed in order to arrive at the total amounts paid by each instructional department listed on lines 2, 3, and 4 of section C, Forms L-2. This analysis will be spoken of hereafter as the Instructional Department Analysis. A suggested method of achieving accuracy is to add the department totals on the Instructional Department Analysis to the total of all non-instructional department entries on the IBM alphabetical list. This total may then be checked against the total of all entries on the IBM alphabetical list mentioned in Step Six, paragraph A above.

Step Six will ordinarily be the responsibility of the business office.

STEP SEVEN

COMPLETION OF FORMS D-1

The Forms D-1, on which the information contained in lines 3, 4, 5, and 6 has already been entered, will now be completed as follows:

A. The department totals as contained on the Instructional Department Analysis will be entered in column 2, line 1, on the Form D-1 of each department. All transfers-in shown in column 3, line 1, will be added, and all transfers-out shown in column 5, line 1, will be subtracted from this figure. The result will be entered in column 7, line 1. It will be recalled that in Step Four, paragraph B, provision was made for the transfer of salary amounts into instructional departments from either the summer session or extension accounts. These transfers occurred when individuals whose entire salaries were paid out of either the summer session or extension accounts had Forms L-2 prepared because

C. In the same manner as on line 1, transfers-in in column 3 of line 2 will be added and transfers-out in column 5 of line 2 will be subtracted. The result will then be entered in column 7.

NOTE: The original worksheet copy of Forms D-1, the IBM alphabetical list, and the Instructional Department Analysis will be returned to the Central Study Office with the completed Forms L-2 and L-3. These will be inserted in the front of the binder containing the Forms L-2.

Step Seven will ordinarily be the responsibility of the business office.

STEP EIGHT

SCHEDULING MEETINGS WITH DEPARTMENT ADMINISTRATORS; TRANSFER OF CLASS DATA FROM FORMS L-2 NOT IDENTIFIED BY INSTRUCTOR; ENTRY ON FORMS L-2 OF RANK, AGE, SEX, ADMINISTRATIVE TITLE, AND TOTAL PERCENTAGE OF FULL-TIME TO THE INSTITUTION

In the heading of each Form L-2 has been entered the name of the department to which the individual was assigned for purposes of administration (see Step Three). This department title will now be used to identify the department administrator to whom the Form L-2 must be taken for completion. Each department administrator is responsible for the completion of Forms L-2 for his department. He will be aided by the Institutional Study Coordinator in order to insure uniformity in their completion. After the first seven steps have been carried out, the Institutional Study Coordinator is ready to meet with and aid each department administrator in the final stages of completing Forms L-2.

The department administrators who have had a Form D-1 prepared for their departments will also, at this time, be assisted by the Institutional Study Coordinator in the completion of Forms L-3 as directed in the instructions for the completion of Form L-3.

The Institutional Study Coordinator will take with him to each conference the following items:

1. All Forms L-2 which have the administrator's department entered in the space designated at the top of the form. These Forms L-2 will include those on which the instructors' names were not indicated and which were set aside in Step One.

2. The IBM alphabetical list.

3. The Master List of Department Code Numbers and Standard Classifications.

4. The Summary List of Standard Classifications.

In addition, he will take with him, when he goes to those departments for which Forms D-1 have been prepared, the following items:

5. A copy of the completed Form A-1.

6. The Form D-1 of the respective department.

7. The Instructional Department Analysis.

8. Blank Forms L-3.

As the first part of Step Eight the department administrator will assemble all those Forms L-2 for his department that do not have an instructor's name in the heading of the form. He will see that all data pertaining to courses and classes on these forms are transferred to the Forms L-2 of those staff members who shared in the teaching of these courses or classes. As the courses and classes appearing on these nameless Forms L-2 are transferred to the Forms L-2 of those staff members who shared in their teaching, the courses and classes will be crossed out in red pencil in a manner leaving the original entry still legible. The original copies of the nameless Forms L-2 will be returned to the Central Study Office along with all other Forms L-2. When this transfer is being made, the number of students transferred to column 5, section A, will be that part of the total enrollment printed on the nameless Form L-2 for which the individual instructor was responsible.

The department administrator will next enter in the heading of each Form L-2 the individual's rank (in terms of an abbreviation), using the line to the left of the enclosed block. The ranks to be used will be:

Rank	Abbreviation
a. Professor	Prof.
b. Associate Professor	Assoc. P.
c. Assistant Professor	Asst. P.
d. Instructor	Instr.
e. Teaching Assistant	T. A.

An individual with a title or academic rank not listed above (e.g., lecturer, associate, assistant) will be reported in terms of the above rank most appropriate to his function and salary. All student assistants or their equivalent appearing on a Form L-2 will be reported as Teaching Assistants.

The individual's age (as of his birthday occurring during the fiscal year 1954-1955) will next be entered on line 1 at the bottom of the form; the individual's sex will be entered on line 2 at the bottom of the form; and any administrative title held, e.g., Comptroller, Dean of Arts and Sciences, Chairman of a Department, or Dean of Students will be entered on line 3.

The total percentage of full-time for the individual for each semester or quarter will next be entered in section B, line 20, columns 5, 6, and, if a quarter school, column 7. No part of this total percentage will include time for work performed in the extension division (except agricultural extension) for which payment is received from the extension division. All individuals will have their percentages of full-time arrived at from the terms of their employment contracts. If the percentage of full-time for a part-time faculty member is not available in the employment records, this percentage will be established by relating the work performed to the institution's policy (formal or informal) concerning part-time work. In the case of a teaching assistant, for example, whose contract of employment specified that he work one-half time during the academic year for a salary of $1,500, 50 per cent will be entered for appropriate semesters or quarters. Those individuals on sabbatical leave with pay for whom a Form L-2 has been initiated will have their percentage of full-time arrived at by relating their sabbatical salary to their regular salary. For example, an individual whose regular salary is $8,000 per year and whose sabbatical salary is $4,000 would be entered as 50 per cent of full-time. The percentage entered in section B, line 20, is to be the total percentage of full-time, regardless of how many different departments or divisions the individual worked in or was paid by.

The department administrator is now ready to distribute the total percentage of full-time, shown for each quarter or semester, among the individual's teaching work in section A and non-teaching work in section B.

STEP NINE

DESCRIPTION OF COLUMNS AND LINES IN SECTION A AND SECTION B OF FORM L-2

Step Nine will set forth descriptions and procedures for each column and line in sections A and B in order to familiarize the department administrator with these sections before he proceeds with the actual distribution of the total percentages of full-time as instructed in Step Ten.

SECTION A. TEACHING WORK ANALYSIS: The information appearing in columns 1 through 6 of Form L-2 is presented to aid the department administrator in identifying the teaching work performed by the individual. All entries in section A have been made for classes reported on Forms L-1.

SEMESTER OR QUARTER DATA: It will be noted that all column headings under First Semester or Fall Quarter are repeated under Second Semester or Winter Quarter, and Spring Quarter. One explanation is therefore set forth below for the three sets of column headings.

COLUMN 1. DEPARTMENT: The code number of the college or school and instructional department in which the listed class was reported on Form L-1 appears here. This code number is contained in column 1 of the Master List of Department Code Numbers and Standard Classifications.

COLUMN 2. COURSE NUMBER: The institution's course number as reported on Form L-1 appears here. A subdivision of a department reported as such on Form L-1 is identified by an alphabetic prefix to the course number in this column. The alphabetic prefix appears as an alphabetic suffix to the department code number in column 1 of the Master List of Department Code Numbers and Standard Classifications.

COLUMN 3. TYPE OF INSTRUCTION: The code number designating the type of instruction appears here. For purposes of this Study, instruction has been coded in four categories: primary non-laboratory organized classes (code number 1); secondary non-laboratory organized classes (code number 2); laboratory organized classes (code number 3); and individual instruction, research, or study (code number 4). Detailed definitions are set forth on pages 8 and 9 of the "Instructions for Completion of Form L-1".

COLUMN 4. SECTIONS: The number of sections of a specific type of instruction appears here.

COLUMN 5. NUMBER OF STUDENTS: The total number of students enrolled in the individual instructor's sections of a specific type appears here. An asterisk appears when the instruction was shared with one or more other instructors.

COLUMN 6. LEVEL OF INSTRUCTION: The code number representing the level of instruction in which the course was classified appears here. These code numbers will be interpreted as follows: Code number 1 - lower division (freshman-sophomore); code number 2 - upper division (junior-senior); code number 3 - graduate division.

COLUMN 7. PERCENTAGE OF FULL-TIME: Detailed instructions for the percentage of full-time to be entered here by the department administrator will be set forth in Step Ten of these instructions.

SECTION B. NON-TEACHING WORK ANALYSIS: In arriving at the amount of time that individuals spent in teaching work, it becomes necessary to segregate the time spent in the performance of non-teaching work. Section B (Non-Teaching Work Analysis) will serve this purpose.

COLUMN 2. DESCRIPTION: The printed descriptive titles represent the standard classifications to which the non-teaching work time of the individual will be charged.

SECTION B, COLUMN 2, LINE 1. TEACHING TIME SUB-TOTAL: The teaching time sub-totals entered in columns 5, 6, and 7 will be brought forward from the teaching time sub-totals in section A for each semester or quarter.

SECTION B, COLUMN 2, LINE 2. DEPARTMENTAL RESEARCH:[*] This line (for each semester or quarter) will reflect time spent by the individual in departmental research. Departmental research is defined as systematic, intensive study for the purpose of expanding the body of knowledge of the subject studied. Departmental research does not, however, include that type of activity defined as class preparation--i.e., reading, experimentation, and all such activities carried on as preparation for teaching duties. The time spent in class preparation will be included in the allocation of time to teaching work. The research may be (1) basic research, which is that type of research directed toward increase of knowledge where the primary aim of the investigator is a fuller knowledge or understanding of the subject under study, rather than a practical application thereof; (2) applied research, which is that type of research directed toward practical application; or (3) development, which is the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, methods, or processes. This departmental research must be carried on as a specifically assigned and/or departmentally planned and/or mutually understood part of the faculty member's total activity. Time so allocated will represent the time actually spent in departmental research; assignment alone cannot be considered as prima facie evidence of performance. Departmental research is also exclusive of organized and sponsored research as defined for line 6.

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[*] This definition is based on the definition of character of research given in Survey of Expenditures on Research and Development at Colleges and Universities, Classification of Research, National Science Foundation, Washington 25, D.C., pages 3-4.

The departmental research for which percentages of time are reported on this line will be classified by subject field in columns 3 and 4 in terms of the most specific, appropriate standard classification in the Study's Summary List of Standard Classifications (standard code numbers 0000 to, but not including, 7300). Ordinarily, this standard classification will be that of the department to which the individual is assigned, as listed for the department in columns 5 and 6 of the Master List of Department Code Numbers and Standard Classifications. The entries in columns 3 and 4 may, however, differ from the departmental listing in the Master List if (a) the person's departmental research is most accurately defined in terms of subject field by a standard classification which is either broader or more specific than that listed for the department, or (b) the subject field of the person's departmental research is outside that of the department to which he is administratively assigned.

SECTION B, COLUMN 2, LINE 3. DEPARTMENTAL ADMINISTRATION: This line (for each semester or quarter) will reflect time spent by the individual in specifically assigned administrative activities related to or affecting one or more instructional departments. This time cannot in many instances be related to a specific department (e.g., Assistant Dean of Arts and Sciences, whose administrative duties relate to more than one instructional department). Examples of the application of time to this activity would be time spent by a department chairman or other individuals in the administration of the department, and time spent in administration of the departments of a school by a dean or member of his staff.

SECTION B, COLUMN 2, LINE 4. PUBLIC AND PROFESSIONAL SERVICES: This line (for each semester or quarter) will reflect time spent in all activities carried on by individuals in the interest of public and professional groups, other than as staff members of organized research bureaus, institutes, etc. (see line 5 below). The entry will include time spent conducting business and educational surveys; holding office in trade, industrial, public, and professional organizations; editing professional journals, etc. It will not include, for example, a man's time spent as treasurer of a church or president of a service club. Public and professional service is not to be confused with the functions performed by departments within the division of Public Service and Information as defined for line 8 below.

SECTION B, COLUMN 2, LINE 5. ORGANIZED ACTIVITIES RELATED TO INSTRUCTIONAL DEPARTMENTS: This line (for each semester or quarter) will reflect time spent in such organized activities as a home economics practice home, laboratory school, dairy farm, creamery, and any other such organized activity related to instructional departments when such time is a specifically assigned part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 5, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 7300-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 6. ORGANIZED AND SPONSORED RESEARCH: This line (for each semester or quarter) will reflect time spent by the individual in the performance of research conducted in separately organized research bureaus, institutes, laboratories, etc., and in separately financed (either from university or outside funds) research projects. This research must be a specifically assigned and/or departmentally planned and/or mutually understood part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 6, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 7400-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 7. LIBRARY: This line (for each semester or quarter) will reflect time spent in library staff functions. It is not to be confused with bibliographical research done by a faculty member in the library. This time must be a specifically assigned part of the person's total activity.

SECTION B, COLUMN 2, LINE 8. PUBLIC SERVICE AND INFORMATION: This line (for each semester or quarter) will reflect time spent in activities such as the following: alumni relations, public information, relations with schools, university press, general bulletins, radio and television, and workshop institutes and conferences. This time must be a specifically assigned part of the person's total activity. Caution will be exercised to insure that the allocation of time is properly differentiated between this title and line 4 (public and professional services). When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity in line 8, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 7600-series (excluding 7608) in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 9. EXTENSION: No percentage of time will be entered on this line (for each semester or quarter), unless the individual performed extension work as part of his regular academic assignment and received no compensation from the extension division for this work.

SECTION B, COLUMN 2, LINE 10. AGRICULTURAL EXTENSION: This line (for each semester or quarter) will reflect time spent by the individual in an agricultural extension division. This time must be a specifically assigned part of the person's total activity.

SECTION B, COLUMN 2, LINE 11. GENERAL ADMINISTRATION: This line (for each semester or quarter) will reflect time spent by the individual in general administrative duties concerned with the entire institution. Examples would be: Governing Board, Vice President, Academic Council, Personnel Office, and Campus Planning. Time allocated to this title must be a specifically assigned part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 10, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 8100-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 12. STUDENT SERVICES: This line (for each semester or quarter) will reflect time spent by the individual in student service work within the institution. Examples would be: Admissions and Records, Dean of Students, and Health Service. No time for counseling will be reported under this title, unless the activities consisted of formal counseling performed in an identifiable amount. Time spent for a day or two at the beginning of a semester aiding students in developing their programs will be included with teaching work. Time for this activity must be a specifically assigned part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 11, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 8200-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 13. STAFF BENEFITS: This line (for each semester or quarter) will reflect time spent by the individual in activities chargeable to staff benefits. Examples would be workmen's compensation, retirement programs including Old Age and Survivors' Insurance, and group life insurance. Time for this activity must be a specifically assigned part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 12, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 8300-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 14. GENERAL INSTITUTIONAL SERVICES AND EXPENSE: This line (for each semester or quarter) will reflect time spent by the individual in activities chargeable to general institutional services and expense. Examples would be Statistical Tabulating and IBM Services, and Administrative Research. Time for this activity must be a specifically assigned part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 13, column 2, section C, and if a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 8400-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 15. PHYSICAL PLANT OPERATION AND MAINTENANCE: This line (for each semester or quarter) will reflect time spent by the individual in physical plant operation and maintenance activities. Examples would be Physical Plant Supervision, Operation of Buildings, and Fire Protection and Safety. Time for this activity must be a specifically assigned part of the person's total activity. When a percentage of an individual's time is allocated to this activity, the department administrator will refer to this same activity on line 14, column 2, section C. If a standard classification code number and a salary amount have been entered in columns 3 and 4, section C, for this activity, he will enter this same standard classification code number in column 3, and the corresponding standard abbreviation (see Summary List) in column 4, of section B. If no standard classification code number has been entered in column 3, section C, the code number entered in column 3 and the abbreviation entered in column 4, section B, will be selected from the 8500-series in the Summary List of Standard Classifications.

SECTION B, COLUMN 2, LINE 16. AUXILIARY ENTERPRISES: This line (for each semester or quarter) will reflect time spent by the individual in auxiliary enterprise activities. Examples would be Residence Halls, Intercollegiate Athletics, and the Student Union. Time for this activity must be a specifically assigned part of the person's total activity.

SECTION B, COLUMN 2, LINE 17. STUDENT AID: No time will be reported on this line. (Time spent in the administration of a scholarship program will be reported on line 12 as standard classification 8207.)

SECTION B, COLUMN 2, LINES 18 AND 19. These lines will not be filled in by the institution, except as specifically authorized and directed by the Central Study Staff.

SECTION B, COLUMN 2, LINE 20. TOTAL PERCENTAGE OF FULL-TIME: This line contains the total percentage of full-time for the individual for each semester or quarter. The percentages have already been entered in accordance with instructions given in Step Eight.

COLUMNS 3 AND 4. SUBJECT FIELD, SERVICE, OR RELATED ACCOUNT IN WHICH THE WORK WAS PERFORMED: These columns will be used to identify the allocated time with the applicable standard classification in the Summary List of Standard Classifications.

COLUMNS 5, 6, AND 7. PERCENTAGE OF FULL-TIME: These columns will be used in the next step (Step Ten) to insert that part of the "Total Percentage of Full-Time", shown for the individual on line 20, estimated to have been spent in the performance of any of the designated work classifications in column 2, lines 2 through 19.

STEP TEN

DISTRIBUTION OF TOTAL PERCENTAGE OF FULL-TIME AMONG TEACHING ACTIVITIES IN SECTION A AND NON-TEACHING ACTIVITIES IN SECTION B OF FORM L-2

Column 7 for each semester or quarter in section A and columns 5, 6, and 7 of section B will now be completed on each Form L-2. That part of the total percentage of full-time, shown for the individual in section B, line 20, and estimated to have been spent in the performance of teaching work related to each line entry in section A will be entered in column 7. All entries in section A have been made for classes reported on Form L-1. If classes are listed on the wrong individual's Form L-2, the error will be brought to the attention of the Institutional Study Coordinator. He will cross out the erroneous entry in red pencil and indicate the number of the page to which the transfer is made. The Form L-2 on which the corrected entry is made will have the course identified in column 2 by an asterisk to the right of the course number. A course may not be added to section A, nor will any course printed in section A be deleted, except as specifically authorized in these instructions. Except for specifically authorized changes, no errors in the reporting of classes on Forms L-1 which are discovered while Forms L-2 are being completed will be corrected on Form L-2; they will, instead, be listed with the appropriate corrections indicated on a sheet titled "Class Corrections". This sheet will be submitted to the Central Study Office with Forms L-2 and will appear as the first page in the binder containing Forms L-2. That part of the total percentage of full-time estimated to have been spent in the performance of non-teaching work will be entered opposite the appropriate classification title in section B. The sum of the percentages for each semester or quarter must equal the "Total Percentage of Full-Time" shown for the individual in section B, line 20.

The time allocation will be based on the actual percentage of full-time spent in the activity. It must represent how time was actually spent, not how it should have been spent or how it was budgeted. The department administrator may use departmental records, the advice of the individual faculty member, or any other available aid in carrying out this responsibility.

When the Form L-2 of a student assistant who spent only part of his "total percentage of full-time to the institution" in teaching is being completed, the remaining activities he performed will be reported on Form L-2. For example, if he spent time grading papers or in any other non-teaching duties directly related to classes such as preparation of laboratory materials, this time will be entered in section A as follows: The code number of the department, as listed in column 1 of the Master List, will be entered in column 1, section A, of Form L-2. The standard classification code number of the specific subject field (column 5 of Master List) will be entered in column 2 in parenthesis. The code number 5 (meaning a teaching assistant, class-related non-teaching duties) will be entered in column 3. Dashes indicating no entry will be put in columns 4 and 5. The level-of-instruction code number will be entered in column 6 (1--lower division; 2--upper division; 3--graduate division). If the individual spent time performing non-teaching duties, this time will be entered in section B.

When the Form L-2 of a faculty member who spent time supervising the individual study of unregistered students who were not reported on Form L-1 is being completed, the code number of the department, as listed in column 1 of the Master List, in which the activity was carried on will be entered in column 1. In such cases it is deemed impracticable to arrive at a course number; section A, column 2, will therefore be used for entry of the standard classification code number of the subject field (column 5 of Master List) in which the supervision of unregistered students occurred. In order that the Central Study Office may differentiate these subject field code numbers from course numbers, the subject field code numbers must be enclosed in parenthesis. Code number 6 (non-registered student supervision) will be entered in column 3. Dashes, indicating no entry, will be put in columns 4 and 5. The level-of-instruction code number will be entered in column 6.

Time spent in supervising teachers in the teaching of specific classes will be entered against the course and type of instruction in which the supervision took place. For example, a professor lectured a large lecture section for two hours a week and divided the lecture section into 10 quiz sections, each taught by a student assistant whose classroom activities were coordinated and supervised by the professor. In this case, the information concerning the lecture section has been printed in columns 1 through 6 (section A) of the professor's Form L-2. The time spent in supervising the 10 quiz section instructors will be included with the percentage of full-time charged to the lecture section.

There are a few Forms L-2 for faculty members of those schools or departments of medicine, dentistry, nursing, pharmacy, and public health that were not reported on Forms L-1. Forms L-2 have been initiated for these individuals because they taught classes in departments which were reported on Forms L-1. A blanket entry of the percentage of time spent in medicine, dentistry, nursing, pharmacy, or public health teaching will be made under the appropriate semester or quarter on Form L-2 (section A). This time will be identified by entering under the column titled Course Number the standard classification code number in parenthesis contained in the 5700-series (see Summary List) which identifies the specific subject field. Dashes, indicating no entry, will be entered in columns 1, 3, 4, 5, and 6.

When completing section B of the Forms L-2 of faculty members on sabbatical leave with pay, the department administrator will enter on line 2 (Departmental Research) the percentage appearing on line 20 (Total Percentage of Full-Time). The code number entered in column 3 and the abbreviation entered in column 4 will be those of the standard classification code number from which the salary was paid as reported in section C. If such an individual is paid by more than one department in section C, the code number and standard classification entered in columns 3 and 4 of section B will be those of the department paying the larger percentage of his total salary.

The Forms L-2 will be checked to insure that each one has been completely filled out and that the percentages for each semester or quarter add up to the "Total Percentage of Full-Time" entered in section B, line 20. The department administrator will sign each Form L-2 in the space so indicated at the top of the form. The original set of Forms L-2 must be returned to the Central Study Office in the same binder in which they were received. The carbon copies (2) will be kept by the institution.

CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY — **FORM L-2: INDIVIDUAL WORK ANALYSIS, 1954-1955**

INSTITUTION: ______ ☐ CAMPUS: ______ ☐ INDIVIDUAL'S NAME: ______ RANK: ______ ☐

COLLEGE OR SCHOOL: ______ ☐ DEPARTMENT: ______ ☐ ADMINISTRATOR'S SIGNATURE: ______

A. TEACHING WORK ANALYSIS

FIRST SEMESTER OR FALL QUARTER							SECOND SEMESTER OR WINTER QUARTER							SPRING QUARTER						
DEPT.	COURSE NUMBER	TYPE OF INSTR.	SECTIONS	NO. OF STUDENTS	LEVEL OF INSTR.	% OF FULL-TIME	DEPT.	COURSE NUMBER	TYPE OF INSTR.	SECTIONS	NO. OF STUDENTS	LEVEL OF INSTR.	% OF FULL-TIME	DEPT.	COURSE NUMBER	TYPE OF INSTR.	SECTIONS	NO. OF STUDENTS	LEVEL OF INSTR.	% OF FULL-TIME
1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
TEACHING TIME SUB-TOTAL							TEACHING TIME SUB-TOTAL							TEACHING TIME SUB-TOTAL						

B. NON-TEACHING WORK ANALYSIS

LINE NO.	DESCRIPTION	SUBJECT FIELD, SERVICE, OR RELATED ACCOUNT IN WHICH THE WORK WAS PERFORMED		PERCENTAGE OF FULL-TIME		
		CODE NUMBER	STANDARD ABBREVIATION	1ST SEM. OR FALL QTR	2ND SEM. OR WINTER QTR	SPRING QUARTER
1	2	3	4	5	6	7
1	TEACHING TIME SUB-TOTAL					
2	DEPARTMENTAL RESEARCH					
3	DEPARTMENTAL ADMINISTRATION					
4	PUBLIC & PROFESSIONAL SERVICES	7600	PROF SERV			
5	ORGANIZED ACTIVITIES RELATED TO INSTRUCTIONAL DEPTS	73				
6	Organized & Sponsored Research	74				
7	LIBRARY	7500	LIBRARY			
8	PUBLIC SERVICE & INFORMATION	76				
9	EXTENSION	7700	EXTENSION			
10	AGRICULTURAL EXTENSION	7800	AG. EXTENSION			
11	GENERAL ADMINISTRATION	81				
12	STUDENT SERVICES	82				
13	STAFF BENEFITS	83				
14	Gen. Institutional Services & Expense	84				
15	Physical Plant Operation & Maint.	85				
16	AUXILIARY ENTERPRISES	8600	AUX ENTER			
17	STUDENT AID	8700	STUDENT AID			
18						
19						
20	TOTAL PERCENTAGE OF FULL-TIME					

C. ACTUAL SALARY EXPENDITURES

LINE NO.	STANDARD CLASSIFICATION OF SUBJECT FIELDS, SERVICES, AND RELATED ACCOUNTS		SALARY EXPENDITURES		
	TITLE	CODE	ACAD. YEAR	SUMMER	TOTAL
1	2	3	4	5	6
1	INSTRUCTIONAL DEPARTMENTS				
2	(a)				
3	(b)				
4	(c)				
5	ORGANIZED ACTIVITIES RELATED TO INSTRUCTIONAL DEPARTMENTS	73			
6	ORGANIZED & SPONSORED RESEARCH	74			
7	LIBRARY	7500			
8	PUBLIC SERVICE & INFORMATION	76			
9	AGRICULTURAL EXTENSION	7800			
10	GENERAL ADMINISTRATION	81			
11	STUDENT SERVICES	82			
12	STAFF BENEFITS	83			
13	Gen. Institutional Services & Expense	84			
14	PHYSICAL PLANT OPERATION & MAINT.	85			
15	AUXILIARY ENTERPRISES	8600			
16	STUDENT AID	8700			
17					
18					
19	TOTAL INSTITUTION SALARY				

1. ______ 2. ______ 3. ______

Assignment No. 6

CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

INSTRUCTIONS FOR THE COMPLETION OF FORM L-3

INTRODUCTION

Form L-3 will be used to distribute the "other departmental expenses" of instructional departments to the functions of teaching, departmental research, departmental administration, public and professional services, and organized and sponsored research. Expenditures for the teaching function will be further broken down among the following levels and types of instruction: freshman-sophomore courses, junior-senior courses, organized graduate classes, and individual graduate study. "Other departmental expenses" will be obtained from the Forms D-1 and will include all departmental expenses not already reported on Forms L-2. The standard object classifications representing the detailed categories in which the "other departmental expenses" will be reported on Form L-3 are: non-faculty salaries, supplies and expense, and equipment purchases.

The task of completing Form L-3 will be the responsibility of the department administrator. It will be accomplished at the time the Institutional Study Coordinator meets with the department administrator for the completion of Forms L-2. In order to complete Form L-3 the department administrator must have completed the Form(s) D-1 for the department as described in Step Seven of the *Instructions for the Completion of Form L-2*. He may use departmental records, the advice of individual staff members (academic or non-academic), any detailed reports of expenditures periodically furnished by the Accounting Department, or any other available aid in carrying out his responsibility. The original typed copy of Form L-3 will be returned to the Central Study Office.

Forms L-3 will be completed for the following:

A. One Form L-3 will be prepared for *each office or headquarters of campus-wide academic administration*, e.g., Dean of (campus-wide) Graduate School. Such offices and headquarters were not always identified on Forms L-1 and therefore do not appear in every *Master List of Department Code Numbers and Standard Classifications*. These offices and headquarters will, however, have been reported as line entries in column 3 of Form A-1, and a Form D-1 will have been prepared for each such office or headquarters.

B. One Form L-3 will be prepared for *each college or school administrative headquarters*, e.g., Office of the Dean.

C. One Form L-3 for the department as a whole will be prepared for *each instructional department* listed in column 3 of the Master List when *only one* specific standard classification appears in columns 5 and 6 of the Master List for the department and all divisions of the department. It will be noted, however, that if Forms D-1 have been prepared for divisions of a department, the department administrator *may* prepare a Form L-3 for each division of a department, even though the divisions have the same standard classification in columns 5 and 6 of the Master List.

D. When more than one specific standard classification appears in columns 5 and 6 for a department and any divisions of the department, a *separate*

Form L-3 will be prepared for each different standard classification listed in columns 5 and 6 of the Master List. No Form L-3 will be prepared for the department as a whole.

DEFINITIONS AND DESCRIPTIONS OF THE ITEMS ON FORM L-3

INSTITUTION: The accepted "short form" of the institution's name will be entered here. The title will be the same as that reported on the Form(s) D-1 from which the money amounts are derived.

CAMPUS OR BRANCH: The distinguishing part of the name of the geographically-separate major unit of the institution will be entered here. The title will be the same as that reported on the Form(s) D-1 from which the money amounts are derived.

COLLEGE OR SCHOOL: The key word(s) of the name of the college or school (e.g., Arts and Sciences, Law) of which the department or administrative headquarters is a part will be entered here.

DEPARTMENT: The key word(s) of the name of the department (e.g., English, Mathematics) will be entered here. On the Forms L-3 prepared for offices of campus-wide academic administration and college or school administrative headquarters will be entered the appropriate title, e.g., Office of the Dean. On the Forms L-3 for each instructional department and for each standard classification will be entered the title in column 3 of the Master List identifying the department in which the expenditures reported on the Form L-3 were incurred. If, as explained in paragraph C in the Introduction, the institution has chosen to prepare separate Forms L-3 for divisions of a department, the title of the division will be entered in parenthesis following the department title.

STANDARD CLASSIFICATION: The standard classification code number and abbreviation entered here will be those which identify the expenditures reported on the Form L-3. On the Forms L-3 prepared for offices of campus-wide academic administration and college or school administrative headquarters will be entered the standard classification code number and abbreviation obtained from the Summary List of Standard Classifications. On the Forms L-3 prepared for each instructional department and each standard classification will be entered the appropriate code number and abbreviation set forth in columns 5 and 6 of the Master List.

COLUMN 1. **STANDARD OBJECT CLASSIFICATION:**

LINE 1. **NON-FACULTY SALARIES:** The salary and wage expense of all departmental employees not reported on a Form L-2 appears here. This will include the salary and wage expense of all clerical employees, non-teaching assistants, and technical staff.

LINE 2. **SUPPLIES AND EXPENSE:** The money amount appearing on this line includes expenditures for office supplies, research supplies, and teaching supplies. Expenditures made for such services as duplicating, travel, hauling, and the repair and maintenance of equipment used within the department will be included in the figure.

LINE 3. EQUIPMENT PURCHASES: Expenditures for equipment used in the department appear under this title. The title will include expenditures for office, teaching, or laboratory equipment.

COLUMN 2. TOTAL EXPENDITURES--FISCAL YEAR: The expenditures (in dollars and cents) for each of the standard object classifications will be brought forward from Form D-1 and entered appropriately on lines 1 through 3 of Form L-3. The amount entered on line 1 of Form L-3 will be obtained from column 7, line 2, of Form D-1. The amount entered on line 2 of Form L-3 will be obtained from column 7, line 4, of Form D-1. The amount entered on line 3 of Form L-3 will be obtained from column 7, line 5, of Form D-1. The amount entered on line 4 of Form L-3 will be arrived at by adding the amounts entered on lines 1, 2, and 3 of Form L-3.

The department administrator should, at this time, initiate a worksheet to (1) arrive at the expenditures to be entered for each standard object classification when more than one Form L-3 must be completed for a single Form D-1; (2) combine the expenditures contained on more than one Forms D-1 in those instances where one Form L-3 must be completed for the several Forms D-1.

COLUMNS 3 AND 4. TOTAL EXPENDITURES--SUMMER AND ACADEMIC YEAR: The analysis on Form L-3 is concerned only with the expenditures for the academic year. It is therefore necessary that any expenditures applicable to the summer period, which are included in the fiscal year expenditures, be segregated and entered in column 3 (summer). The expenditures applicable to the academic year will be entered in column 4 (academic year).

The department administrator should, at this time, initiate a worksheet to arrive at the division of the individual amounts in column 2, within any one of the expense classifications (lines 1, 2, and 3), between the academic year and summer. This worksheet may also be used to divide the academic year expenditures among the functions and levels (columns 5 through 12).

Any fiscal-year employee whose salary included in the amount on line 1 (non-faculty salaries) applies to both the academic year and summer period may have this division made according to the following percentages as was done for fiscal-year faculty on Form L-2.

Institution	Academic Year %	Summer Period %
California		
Berkeley	83.0	17.0
Davis	82.4	17.6
Los Angeles	83.6	16.4
Riverside	83.9	16.1
Santa Barbara	83.3	16.7
Indiana	81.8	18.2
Iowa	80.0	20.0
Michigan State	80.9	19.1
Minnesota	79.1	20.9
Penn State	81.2	18.8
Purdue	78.5	21.5
Vanderbilt	76.7	23.3
Wabash	80.6	19.4

When dividing the expenditures on line 2 (supplies and expense) and line 3 (equipment purchases) between the summer period and academic year, the expenditure cannot necessarily be reported as of the period in which it was recorded. For example, assume that an expenditure of $500 for office supplies was recorded in the expenditure ledgers during August, 1954. These supplies were not intended for use only in the summer, and were actually depleted during both the summer of 1954 and the academic year 1954-1955. It would, in this instance, be completely illogical to report the entire $500 in column 3 (summer) on the Form L-3. For this reason, such expenditures will be prorated between the summer and the academic year on the basis of the best available estimate of their use during the two periods. The best available estimate of use may, at the discretion of the department administrator, be based on the relation of the volume of an operating statistic occurring in the summer to the volume occurring in the academic year. Examples of operating statistics are the number of enrolled students and the number of student-credit-hours.

Columns 3 and 4 will be totaled on line 4. The total on line 4, column 2, must equal the sum of columns 3 and 4.

COLUMN 5. FRESHMAN-SOPHOMORE COURSES: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of courses, or for services related to courses, offered as first- or second-year courses. No money amounts will be reported in this column on Forms L-3 prepared for offices of campus-wide academic administration and for college or school administrative headquarters.

COLUMN 6. JUNIOR-SENIOR COURSES: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of courses, or for services related to courses, offered as third- or fourth-year courses. Fifth-year courses which were part of a program leading to a bachelor's degree will be classified as junior-senior courses. No money amounts will be reported in this column on Forms L-3 prepared for offices of campus-wide academic administration and for college or school administrative headquarters.

COLUMN 7. ORGANIZED GRADUATE CLASSES: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of courses, or for services related to courses, in which the instruction was given in organized classes beyond the junior-senior level. (See above remark concerning fifth-year courses.) No money amounts will be reported in this column on Forms L-3 prepared for offices of campus-wide academic administration and for college or school administrative headquarters.

COLUMN 8. INDIVIDUAL GRADUATE STUDY: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of individual graduate study. This category is intended to cover only graduate offerings where the relationship between the instructor and the student was on an individual basis rather than on an organized-class basis. No money amounts will be reported in this column on Forms L-3 prepared for offices of campus-wide academic administration and for college or school administrative headquarters.

COLUMN 9. DEPARTMENTAL RESEARCH: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of research carried on as a specifically assigned, departmentally planned, or mutually understood part of faculty members' total activity within the department. (See the definition of this title included in Step Nine of the Instructions for the Completion of Form L-2.)

COLUMN 10. DEPARTMENTAL ADMINISTRATION: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of specifically assigned administrative activities related to or affecting the department. (See the definition of this title in Step Nine of the Instructions for the Completion of Form L-2.)

COLUMN 11. PUBLIC AND PROFESSIONAL SERVICES: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of all activities carried on by individuals within the department in the interest of public and professional groups. (See the definition of this title in Step Nine of the Instructions for the Completion of Form L-2.)

COLUMN 12. ORGANIZED AND SPONSORED RESEARCH: In this column will be entered the amount of money, of that reported in column 4 (academic year), which was spent in support of all activities of departmental faculty members in the performance of research conducted in separately organized research bureaus, institutes, laboratories, etc., and in separately financed (either from university or outside funds) research projects.

CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

FORM L-3: OTHER DEPARTMENTAL EXPENSES, 1954-1955

Institution: ____________________ A ☐

Campus or Branch: ____________________ B ☐

College or School: ____________________ C ☐

Department: ____________________ D ☐

Standard Classification: ____________________ E ☐

STANDARD OBJECT CLASSIFICATION	TOTAL EXPENDITURES ($)			DISTRIBUTION OF ACADEMIC YEAR EXPENDITURES							
				LOWER DIVISION	UPPER DIVISION	GRADUATE DIVISION		DEPT. RESEARCH ($)	DEPT. ADMIN. ($)	PUBLIC AND PROF'L SERVICES ($)	ORGANIZED AND SPONSORED RESEARCH ($)
	FISCAL YEAR	SUMMER	ACADEMIC YEAR	FRESHMAN SOPHOMORE COURSES ($)	JUNIOR SENIOR COURSES ($)	ORGANIZED GRADUATE CLASSES ($)	INDIVIDUAL GRADUATE STUDY ($)				
1	2	3	4	5	6	7	8	9	10	11	12
1. NON-FACULTY SALARIES											
2. SUPPLIES & EXPENSE											
3. EQUIPMENT PURCHASES											
4. TOTAL OTHER EXPENSES											

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INSTRUCTIONS FOR THE COMPLETION OF FORM L-3

With reference to paragraphs C and D on pages one and two, if there were no expenditures reported for a given department in column 10 on Form A-1 (and hence no Forms D-1 were prepared), a Form L-3 will nevertheless be prepared for each standard classification listed for that department in columns 5 and 6 of the Master List of Department Code Numbers and Standard Classifications. If these "other departmental expenses" are already included in another department's Form L-3 for this same standard classification, a reference to the other department's Form L-3 will be entered on the Form L-3 being prepared and no transfer will be made. If, however, the "other departmental expenses" are included in another department under a different standard classification, the appropriate amount will be transferred to the appropriate Form L-3.

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COLUMNS 3 AND 4. TOTAL EXPENDITURES--SUMMER AND ACADEMIC YEAR:

The division, if any, of salaries between the academic year and the summer period is to be based upon the best judgment of the department administrator. He may use the percentages suggested in this section, departmental records, or any other means available. If salaries are divided, the Institutional Study Coordinator will append a statement to the Forms L-3 indicating the manner in which the institution made the division.

Assignment No. 6

CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY

INSTRUCTIONS FOR THE COMPLETION OF FORM D-1

The objective of Form D-1 (Departmental Expenditure Worksheet) is to provide an orderly and well-controlled procedure for arriving at the dollar amounts to be reported on Forms L-3 (Other Departmental Expense).

A Form D-1 will be prepared for each account title in column 3 of Forms A-1 for which an expenditure figure is reported in column 10 from standard classification code number 0000 (General Academic) to but not including 7300 (Organized Activities Related to Instructional Departments), except that Forms D-1 will not be prepared for account titles reported under standard classification code number 5700 for departments whose teaching programs were not reported on Forms L-1.

After the business office has carried out its phase of the work on Forms D-1 in accordance with the following instructions, the forms will be retained by the Institutional Study Coordinator until he meets with the department administrators to complete Forms L-3. The use of Forms D-1 in the completion of Forms L-3 is explained in detail in the instructions for the completion of Forms L-3.

DEFINITIONS AND DESCRIPTIONS OF THE ITEMS ON FORM D-1

INSTITUTION: The accepted "short form" of the institution's name will be entered here, i.e., the same as the title reported on Form A-1.

CAMPUS OR BRANCH: The distinguishing part of the name of the geographically-separate major unit of the institution will be entered here, i.e., the same as the title reported on Form A-1.

ACCOUNT TITLE: The account title (preceded by the account number, if any) as reported in column 3 of Form A-1 will be entered here.

ADMINISTRATIVE UNIT: The college, school, or department name under which the account is reported on Form A-1 will be entered here.

STANDARD CLASSIFICATION: The 4-digit code number and abbreviation of the standard classification under which the administrative unit and the account are reported on Form A-1 will be entered here.

COLUMN 1. STANDARD OBJECT CLASSIFICATION: On lines 1 through 6 are printed the standard object classificationswhich will be used by each institution in classifying expenditures reported on Form D-1.

LINE 1. FACULTY SALARIES: Faculty salaries will include the salaries of all individuals paid by the department who had academic rank and all student assistants who had direct teaching assignments.

LINE 2. NON-FACULTY SALARIES: Non-faculty salaries will include the salary and wage expense of all other departmental employees, such as clerical employees, non-teaching assistants, and technical staff.

LINE 3. TOTAL SALARIES AND WAGES: Total salaries and wages will include the salary and wage figures of all individuals paid by the department, i.e., the sum of lines 1 and 2.

LINE 4. SUPPLIES AND EXPENSE: Supplies and expense will include expenditures for office supplies and teaching supplies. Expenditures made for services such as duplicating, travel, hauling, and the repair and maintenance of equipment used within the department will be included in this figure.

LINE 5. EQUIPMENT PURCHASES: Equipment purchases will include all current expenditures for office, teaching, and laboratory equipment.

LINE 6. TOTAL DEPARTMENTAL EXPENDITURES: The total departmental expenditures will equal the total of lines 3, 4, and 5.

COLUMN 2. CURRENT FUNDS EXPENDITURE TOTAL: The business office will fill in line 3 - TOTAL SALARIES AND WAGES; line 4 - SUPPLIES AND EXPENSE; line 5 - EQUIPMENT PURCHASES; and line 6 - TOTAL DEPARTMENTAL EXPENDITURES. Lines 1 and 2 will be completed in columns 2 and 7 at a later date by individuals responsible for the completion of Forms L-2 in accordance with instructions for the completion of Forms L-2. The total shown on line 6, column 2, will agree with the total expenditure shown for the account in column 4 of Form A-1.

COLUMN 3. TRANSFERS-IN--AMOUNT: Each transfer into accounts for which Forms D-1 are prepared will be brought forward from Form A-1 and reported in column 3 of Form D-1 on the line (1 through 5) to which the transfer applies. For example, the expense of a central stenographic bureau or central telephone account which has been treated as a transfer-in on Form A-1 will be entered on line 4 (supplies and expense). The total on line 6 of Form D-1 in column 3 will agree with the total of all transfers-in reported for the account in column 7 of Form A-1.

COLUMN 4. STANDARD CLASSIFICATION CODE: The standard classification code number for each amount reported in column 3 will be entered here. This code number will be that shown in column 9 of Form A-1 identifying the standard classification from which the amount was transferred.

COLUMN 5. TRANSFERS-OUT--AMOUNT: Each transfer out of accounts for which Forms D-1 are prepared will be brought forward from Form A-1 and reported in column 5 of Form D-1 on the line (1 through 5) to which the transfer applies. For example, an institution's contribution to a retirement fund, if included in the expenditures of individual accounts and reported as a transfer-out on Form A-1, will be entered on line 1 (faculty salaries) and/or line 2 (non-faculty salaries). The total on line 6 of Form D-1 in column 5 will agree with the total of all transfers-out reported for the account in column 8 of Form A-1.

COLUMN 6. STANDARD CLASSIFICATION CODE: The standard classification code number for each amount reported in column 5 will be entered here. This code number will be that shown in column 9 of Form A-1 identifying the standard classification to which the amount was transferred.

COLUMN 7. ADJUSTED CURRENT FUNDS EXPENDITURE TOTAL: Lines 3, 4, 5, and 6 of column 7 will be completed by the business office. The total shown on line 6, column 7, will agree with the adjusted total expenditure shown for the account in column 10 of Form A-1.

NOTE: All expenditure figures reported on Forms D-1 will be expressed in terms of dollars and cents.

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FORM D-1: DEPARTMENTAL EXPENDITURE WORKSHEET, 1954-1955

Institution: ______________________

Campus or Branch: ______________________

Account Title: ______________________

Administrative Unit: ______________________
(College, School, or Department)

Standard Classification: ______________________

STANDARD OBJECT CLASSIFICATION	CURRENT FUND EXPENDITURE TOTAL	TRANSFERS				ADJUSTED CURRENT FUND EXPENDITURE TOTAL
		IN		OUT		
		AMOUNT	STANDARD CLASS. CODE	AMOUNT	STANDARD CLASS. CODE	
1	2	3	4	5	6	7
1. FACULTY SALARIES						
2. NON-FACULTY SALARIES						
3. TOTAL SALARIES AND WAGES			☒		☒	
4. SUPPLIES AND EXPENSE						
5. EQUIPMENT PURCHASES						
6. TOTAL DEPT'L EXPENDITURES			☒		☒	